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In this issue

Problems and Trends in Migrant Education
GEORGE E. HANEY

Inservice Education of Mathematics Teachers
VERYL SCHULT AND THEODORE L. ABELL

JULY 1963

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Commissioner Keppel says—

One weak school is a drag on the Nation

OUR PRESENT SYSTEM of financing our educational enterprise was established when our Nation was composed of a highly rural population with strong local ties, when only a small proportion of our young people completed the traditionally academic high school program and even a smaller proportion went on to higher institutions. We have now grown into a complex and highly mobile society in which commerce and international relations blur State lines. It has been estimated that each family moves, on the average, about once in 5 years, frequently across State lines.

A student educated in one State may later live and work in a whole series of States; and the product of his profession may reach national or even international markets. The same conditions that have made the improvement of our highways and other public services a matter of national concern and a national responsibility now make the improvement of educational opportunity a national responsibility. Weak schools at one level or in one area are a drag on all levels and all areas, and to deprive any group of opportunities for intellectual development is to waste our national pool of human resources.

Adapted from an address at the annual meeting of the National Association of College and University Business Officers, Pittsburgh, July 15, 1963.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE • ANTHONY J. CELEBREZZE, *Secretary*
OFFICE OF EDUCATION . . . FRANCIS KEPPEL, *Commissioner*
MARTIN MAYES, *Acting Director, Office of Information*

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Notes on the Notable

FEDERAL PROGRAMS AND ACTIVITIES

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Educational television

A 5-YEAR FEDERAL PROGRAM of financial aid is now underway to encourage new and expanded educational television (ETV) broadcast stations around the Nation. Money for the first grants became available in mid-May, when President Kennedy signed a bill providing $1.5 million for the matching-fund program. That sum was the first installment of the $32 million program designed to give ETV planners the financial lift they need to get on the air. The aid was authorized by the Educational Television Facilities Act of 1962, enacted to bring the benefits of electronic education to millions of adults and children.

The educational and cultural potential of ETV has barely been tapped since its inauguration in the past decade. Although the Federal Communications Commission (FCC) has reserved 332 television channels for educational purposes, only about 80 educational television stations were in operation by mid-1963. It has been estimated that ETV is being used in the teaching of more than 8 million students in 800 school systems and 400 colleges and universities.

The grants are available to eligible applicants in the 50 States, the District of Columbia, and Puerto Rico. There is a limit of $1 million on the total that may be allocated for transmission equipment to be situated in any one State. The Federal assistance may be up to 50 percent of the cost of a project, with an additional amount of up to 25 percent of the cost of a project if the applicant has previously made an investment in broadcast equipment. Federal and matching funds may be used only for transmission purposes. This excludes the use of funds for land, buildings, furnishings, and operating expenses.

The program is open to agencies or officials responsible for State or local elementary, secondary, or higher education; State educational television agencies; tax-supported colleges or universities; and nonprofit foundations, corporations, or associations organized to engage in or encourage educational television broadcasting.

Public and private agencies, institutions, and individuals wishing to be continuously informed of actions taken under the program should request to be put on the program's information register. Write to the Secretary of Health, Education, and Welfare, Educational Television Facilities Program, Washington, D.C. 20202.

Reprints available from *Indicators*

REPRINTS OF ARTICLES on or related to education from the periodical *Health, Education, and Welfare Indicators* are available. They include—

School Assistance in Federally Affected Areas
From Work Relief to Rehabilitation Through Work and Training
Library Services
Mental Retardation
Limited Educational Attainment: Extent and Consequences

Copies can be obtained without charge from the Office of Program Analysis, Office of the Assistant Secretary for Legislation, U.S. Department of Health, Education, and Welfare.

Indicators, a monthly report on the programs of the Department of Health, Education, and Welfare, is for sale for $3.50 a year from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

Technical education increasing

SINCE the National Defense Education Act went into effect in 1958, the increase in technical education programs has been marked. In 1962, 381 junior colleges, vocational-technical schools, technical institutes, and universities were offering NDEA technical programs, an increase of 230 since 1959. In the same year, more than 40,000 students were enrolled in 2- or 3-year post secondary technical education programs, in such fields as data processing and computer programing, instrumentation, and aeronautical, chemical, civil, electrical, electronic, and metallurgical technologies.

Project English

THE Office of Education has allocated funds to Project English for the support of demonstration centers in English in fiscal year 1964. The funds are authorized under the Cooperative Research Program.

The centers may demonstrate a complete English program or selected parts of a program such as the teaching of literature, the use of linguistics, an integrated program in composition, or the use of audiovisual aids. They will permit and encourage teachers and other school staff members to observe their demonstrations and will disseminate information about particularly successful content, techniques, and programs of instruction. A center may deal with English programs at the elementary, secondary, or college level.

To date the Office has received 28 proposals for centers and has approved 3. They are listed here by institution, director, and title or subject:

The University of California at Berkeley, Mark Schorer, director: A demonstration center in English.

The Euclid, Ohio, Public Schools, George Hillocks, Jr., director: A comprehensive program in English for the 7th, 8th, and 9th grades; literature, language, and composition.

Contract for the third center, at New York University, is being negotiated.

Persons interested in more detailed information on the demonstration centers or other phases of the Project English program may write to the Coordinator of Project English, Cooperative Research Branch, U.S. Office of Education, Washington, D.C. 20202. The next deadline for the submission of proposals is September 1.

CD in Minnesota

So IMPORTANT does the Governor of the State of Minnesota, the Honorable Karl F. Rolvaag, consider the civil defense adult education program that he proclaimed June as Government Employees' Month—that is, a month in which all government employees in his State would take, during business hours, the 12-hour civil defense course for adults. Minnesota has about 10,000 government—municipal, county, State, and Federal—employees.

In his letter to mayors and chairmen of county commissions, Governor Rolvaag pointed out that the State needs a "better understanding of the functions of government in an emergency, especially during a nuclear attack" and that the program to be conducted in June was one step to "alert Minnesota adults to their need for preparedness."

Government Employees' Month in Minnesota is another example of the programs State and local governments are conducting under the civil defense adult education program offered with Federal support through the Nation's public schools. The Office of Education administers the Federal program under contract with the Office of Civil Defense. The program is now offered by State departments of education to adults in 45 States, Puerto Rico, and the District of Columbia.

Schools and local government

One theme of the 1962 national Conference on the Impact of Urbanization in Education was the necessity for a closer working relation among units of local government. According to the *Summary Report* of the conference, the very independence of the school system requires it to make a conscious effort to coordinate programs in cooperation with its local government, and effective coordination will result in planning, scheduling, and other actions that will benefit the school system and all other units of the local government. "Perhaps the best examples of the benefits possible from such coordination can be found in localities which have successfully and fully included the schools, as well as other parts of local government, in the step-by-step development of plans and programs for the future of the city and for its renewal," the report concludes.

The Office of Education, in response to the conference, is developing intensive case studies to illustrate the efforts of local governments to enlist the cooperation of school and other local agencies in the search for solutions to common problems. The study, scheduled for completion in the fall, is being conducted by James Mauch, assistant specialist, urban school system planning, in the Local School Systems Section, Administration Branch.

School planners organize

THE Metropolitan School Facilities Planning Group, a voluntary organization of chief planning authorities of school districts in major U.S. cities, held its first annual meeting in the Office of Education, June 13–14, 1963. The School Housing Section of the Office serves as liaison for the group and coordinates its activities, and William W. Chase, Office specialist in school plant administration, has been elected secretary.

One of the specific objectives of the group is to participate in or encourage others to undertake studies and research in the planning of school facilities, particularly studies and research that will benefit central school districts in large cities. At this meeting the group discussed school building design in metropolitan centers and controlling or limiting factors in design that need investigation such as building and health codes, zoning regulations, site limitations, construction costs, and cost comparisons.

Before its next meeting various members will study local, State, and national building, fire, and health codes that affect school construction; construction costs and criteria needed to establish comparable costs; and the effects of urban renewal developments on the planning of school buildings and costs of replacing buildings.

The group will hold its second annual meeting in Chicago in 1964. Edwin A. Lederer, associate superintendent in charge of operation services, Chicago Board of Education, will serve as general chairman.

American Education Week 1963

THE FOUR SPONSORS of American Education Week—the American Legion, National Education Association, National Congress of Parents and Teachers, and the Office of Education—have chosen "Education Strengthens the Nation" as theme for American Education Week 1963 (November 10–16). In addition, they have selected themes for each day of the week:

Nov. 10	Values for free men
Nov. 11	Learning opportunities for all
Nov. 12	Quality teaching
Nov. 13	Balanced curriculum
Nov. 14	Community resources
Nov. 15	Financial support
Nov. 16	Goals for the future

American Education Week has been celebrated by schools across the Nation since 1920 as a salute to teachers and teaching. During the week citizens visit their schools and take part in special programs.

Mental health in the schools

A COMMITTEE on mental health, representing three national organizations, will meet in Hartford, Conn., October 27–November 1, to develop the basic plan for a policy statement on the role of mental health in the schools. The three groups are the Association of State and Territorial Health Officers, the Association of State and Territorial Mental Health Authorities, and the Council of Chief State School Officers. David Zimmerman, Deputy Commissioner of Education of Maryland, is chairman of the committee. The Office of Education and the Public Health Service will supply consultants to the committee.

GEORGE E. HANEY

Problems and trends in migrant education

Migrant workers and their families

Every year nearly 1 million migrant workers and their families move in three major human streams across the country, from one short-term job to another. The east coast stream—an estimated 500,000 workers, mostly Negroes—begins during the winter months and moves from the southeastern seaboard as far north as New England. The central and Great Plains stream—an estimated 175,000 workers, almost entirely all of Mexican descent—moves up from Texas through the Central States as far north as the Great Lakes. The western stream—more than 100,000 workers chiefly of Mexican descent, originates in California and moves up the coast into Idaho, Oregon, and Washington. (Figures on the movement of workers and the number of workers in each stream are from *Children in Migrant Families*, published by the U.S. Department of Health, Education, and Welfare, Social Security Administration, Children's Bureau. It is available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402).

With some reason the migrants have been called "America's forgotten people." While they are traveling across the country they live and work under conditions of extreme poverty, ignorance, and deprivation. (In 1959 the average migrant earned less than $1,000, according to the U.S. Department of Labor.) Because they are not permanent residents of the communities they go through, they are often denied public health, educational, and welfare services. The infant mortality rate among them is estimated to be double that of the country as a whole, and few migrant children have been immunized against diphtheria, whooping cough, or tetanus (*Monthly Labor Review*, vol 85, p. iii).

A migrant's life is no easier if he leaves farmwork. Many migrants have given up their nomadic way of earning a living and settled in northern cities. There many have swelled unemployment, relief, and welfare rolls because they have neither the education nor the skills that most urban jobs require; and their children have increased enrollment in already overcrowded classrooms.

THE MOST EDUCATIONALLY deprived group of children in the Nation—these are the children of our domestic agricultural migratory workers.[1] Most migrant children enter school late, their attendance is poor, their progress is slow, and they drop out early. The result? Most of them are far below the average grade level for their age, their achievement is usually under the fourth grade, and the illiteracy rate among them is high.

The sorry plight of these children has become a critical national problem since illiteracy or lack of an elementary education can condemn them to a life of ignorance, poverty, and dependence on society.

For more than a decade the public has been aware of the plight of these children. In 1951 the President's Commission on Migratory Labor said:

> This Commission wishes to reiterate its conviction that the education of the children of migratory farmworkers (and their parents also) is one of the most urgent and most essential of many steps which the Nation can and should take to improve the lot of migrants who have for so long been deprived of what the rest of us take for granted.

Even though local and State educational agencies have made considerable progress in improving educational programs for these children in the decade since the Commission spoke, recent studies and reports indicate that tens of thousands of migrant children still do not have an opportunity for education equal to that of other American children.

Just how many thousands of migrant children there are is hard to determine because they are on the move so much of the time. In 1954 the U.S. Department of Agriculture estimated that the number under 18 years old ranged between 175,000 and 225,000. In 1962 in hearings before the Senate subcommittee, the number was put at 150,000.

It is not hard to believe that the vast majority of these migrant children are being denied their birthright. There is ample evidence that they are among the most educationally deprived in the country: surveys and studies by

[1] Hearings Before the Senate Subcommittee on Migratory Labor, April 1961. Washington, U.S. Government Printing Office, 1961, p. 16.

MR. HANEY *is specialist, education for migrant children, in the Office of Education, and a member of the ad hoc committee of the President's Committee on Migratory Labor and the Interdepartmental Committee of the U.S. Department of Health, Education, and Welfare. He has served as teacher, principal, and superintendent of schools in an agricultural community where migrant children were enrolled and for a time was U.S. Government supervisor of Mexican agricultural workers. Mr. Haney was for many years superintendent of schools in Butte, Mont.*

Federal and State agencies and local school systems report facts too much alike to be questioned. For example:

A 1960 survey by the U.S. Department of Agriculture found that migratory farmworkers 20 years old and older had completed a median of 6.9 years of school compared with 10 years for all Americans in the same age group (*Monthly Labor Review*, vol. 85, p. iii).

A survey paper prepared for the 1960 White House Conference on Children and Youth says that these children are far below grade level and that their average achievement in school generally is under fourth grade—the minimum standard for literacy.

The Department of Labor says that, among 2,301 migrant children found employed on farms in violation of the child-labor provisions of the Fair Labor Standards Act, 72 percent were enrolled in grades below the normal level for their ages.

A 1959 study by the Colorado State Department of Education found that 16 percent of all parents surveyed had no formal education, and less than 25 percent had completed only the grades in the first to fourth level.

A 1961 report from New Jersey says "Though complete data are not available, school reports from several States show that possibly as few as 1 in 50 enters high school and fewer than this graduate. Consequently vocational training courses and school guidance services usually offered in the high school are virtually out of reach of these youngsters." (Curtis Gatlin, *The Education of Migrant Children in New Jersey*, Trenton, Department of Labor and Industry, 1960, p. 2.)

The States of Ohio, Oregon, Pennsylvania, and Texas and others have made similar studies of the educational achievement of migrant children, and all indicate a high rate of retardation among them. The studies also indicate that they become progressively more retarded, that they fall further behind until they drop out of school in the elementary grades, and that few enroll in high school.

Studies and State surveys have found that migratory pupils are not educationally retarded because they lack intelligence or ability, but because they lack the opportunity to attend school regularly and to receive a continuous program of education.

The schooling of the migrant child is frequently interrupted by movements of his parents from one community to another. Studies indicate that most migrant families do not spend more than 5 months, or at the most 7 months, in any one place. Each time the family moves during the regular school year, the child loses time from school.

Each year these 150,000 children accompany their parents from community to community and from State to State. And each year they confront local and State school authorities with serious educational problems. The high rate of retardation and the low educational attainment of migrant children compound the schools' problems of providing for them. In turn, the inability of some schools to meet these problems contributes to the further retardation of the children.

Problems

Providing for the education of migrant children during the regular school year creates many difficult and complex problems which have many social and economic ramifications. The seasonal impact of migratory children on school systems along the routes creates problems of finance, school transfer records, grade placement of pupils, and provision of teachers and school facilities. There is, in addition, the problem of getting migratory children to enroll and attend school regularly.

Seasonal impact.—In some communities it is not uncommon for the number of school-age children to increase by more than 100 percent during the harvest season. Lack of financial support to provide additional classrooms, teachers, transportation, equipment, textbooks, and supplies often makes them an unacceptable burden. Since the numbers of workers vary greatly from year to year, school officials find it difficult to plan provision for the migratory children who will reside in their community during the harvest season. This presents a most serious problem to officials with restricted budgets. If officials have no assurance of the number, they may decide that expenditures for additional facilities are not economically advisable.

School transfer records.—It is not uncommon for migrant children to be told on arriving home from school at the end of the day that they must immediately get ready to move on to the next community. Since school officials have had no advance information about the children leaving or where they are going, they do not send transfer records along. If the children enter school in the next stop on the road, their new teachers may write to former teachers for transfer record cards. Many children, however, do not reenter schools in other communities while they are on the trek. By the time they arrive at their home base in November, some have forgotten the names or addresses of the schools they attended.

Educators say that many migrant children still do not bring transfer records, and that those they present do not contain sufficient information for grade placement. In 1955 the U.S. Office of Education developed a transfer record form for children to carry from school to school. Several districts have used this form, but because of the difficulties of migrant life and State variations in regulations, it has had limited use. Some communities in California and Colorado have agreements with other communities in and out of their own States to send records by mail when children move.

Although more migrants than formerly are presenting transfer records, a survey of seven State programs found that interstate agreements were needed on the type of information to be supplied and the methods of sending

records from school to school.[2] It has also been suggested that a clearinghouse be established for the school records of migratory children in the east coast stream.[3]

Grade placement of pupils.—One of the serious obstacles to officials in planning a suitable program for a migrant child is their not knowing the level of his academic achievement and the grade in which he should be placed to enable him to progress and benefit the most from his educational experience. When a migrant does not bring a record from the previous schools he has attended, an evaluation can be made on the basis of such factors as his chronological age, achievement, reading ability, physical maturity, and social adjustment. Much time is lost in this procedure by both the pupil and the teacher. If migrant children carried their school records with them, schools could plan suitable programs for them and place them without loss of time and effort.

Providing teachers for migrant children.—One of the critical problems in the education of migrant children is to provide teachers who understand their cultural background and their socioeconomic and educational needs. It is difficult for teachers with overcrowded classrooms to adapt the established curriculum to children who enter school late or to initiate a different program of studies for them. This presents a difficult task to the experienced teacher and an almost impossible problem to the unprepared or inexperienced teacher.

When school districts have an unusually large influx of children, providing teachers as well as classrooms for them may seriously handicap the school program. The children may enter a community in late September or early October, from 2 to 8 weeks after the opening of school. Unless the district has already made plans for them, it may have difficulty in finding qualified teachers to augment the regular staff.

The school attendance problem.—It is estimated that a large number of school-age children do not attend school from the time they leave their home-base State early in April until they return in November or December. The Office survey of seven State programs (1961) found that approximately 50 percent of the migrant children who resided in Ohio and Oregon and 25 to 30 percent of those who resided in Colorado during the regular school sessions never enrolled in school.

A study in Michigan reports that 17 percent of 917 children did not attend school during the year 1956–57. Reports from home-base schools in Florida and Texas reveal that most migrant children arrive at school 2 and 3 months late and leave as much as 6 and 8 weeks before school closes in the spring, and that most of them do not enter school from the time they leave their home base until they return.

The Office survey also revealed a number of reasons why migrant children do not attend school regularly or never enroll during the regular school year. Among the most important are the following: The parents' lack of education or their attitude toward the importance of education for their children; their need for the children's earnings or for older children to care for their younger brothers and sisters while the mother works in the field; and the language barrier in areas where Spanish-speaking migrants are working. Other reasons reported by the survey, though less important, kept children out of school: The communities' attitude of rejection or indifference toward migrants; attendance laws of some communities, which bar transients; failure of local officials to enforce attendance and child labor laws; lack of school facilities to provide for a large influx of migrants; lack of proper food or clothing for children of school age; lack of school transfer records; lack of financial assistance to provide school supplies and facilities for the migrants.

Some communities along the migrants' routes declare "crop vacations" and close schools during the peak of the harvest season so that children can help gather crops. Local children have an opportunity to make up lost time, but migratory pupils do not. They move on to the next community where schools may also be closed for crop vacations.

Need for educational continuity.—The variations between school districts and States in textbooks, curriculums, and programs of study make it difficult to provide migrant children with a continuous and sequential educational program. Different teachers, textbooks, methods of study, and achievement standards confuse and shake the self-confidence of children who may enroll in as many as four or five schools each year. This situation encourages dropouts.

In order to provide more continuity and articulation in the educational program of children on the move, some educators have proposed that short-term units in basic skills be developed for use in both regular and summer sessions. With an outline of such units, the children would have a better opportunity to progress from one unit to another in each school where they enroll. The units would provide a guide to a more continuous program of study and would help avoid duplications and omissions in their educational programs.

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[2] George E. Haney, *Selected State Programs in Migrant Education*, U.S. Department of Health, Education, and Welfare, Office of Education, 1963. (In press)

[3] U.S. Department of Health, Education, and Welfare and the U.S. Department of Labor, *Report of East Coast Migratory Labor Conference.*

Short units could be developed through experimentation and cooperation among school districts and States along specific migratory routes. Such cooperation would, however, call for interstate agreements, which are hard to obtain. In addition funds would be required for curriculum research and experimentation.

Financing school programs.—It is difficult for some school systems to solve financial problems created by children who cross district and State lines. It is especially difficult for rural schools: "The seasonal impact of these children produces an acute fiscal problem for rural educational systems which, in comparison to urban school systems, already face the most serious handicap in our educational system." [4]

The many problems teachers and administrators face in trying to provide for migrant children has made State action and support necessary in some States. In 1962 nine States were providing financial assistance to school districts for the operation of summer schools. Other States were providing financial assistance to local school districts on the basis of average daily attendance of migratory children at the regular school session. For example, Pennsylvania reimburses the school districts $1 per day per child attending regular sessions, up to 40 days.

Summer programs

Since most migrant children attend school 6 or 7 months during the school year and must adjust to several new schools each year, they are seldom able to earn promotion from grade to grade. Local communities and States have made several notable efforts to provide a more continuous program of education for these children.

Several Northern States are supporting summer session programs to provide migrant children with an opportunity to make up time lost from school. These schools were first organized by voluntary and religious groups in the early 1940's, most of them as experimental pilot projects. But as the schools gave evidence of meeting the migrants' urgent need for education, the States began to assume the responsibility for their operation as early as 1947.

During the summer of 1961, seven States (California, Colorado, New Jersey, New York, Ohio, Oregon, and Pennsylvania) were providing financial assistance to school districts for the operation of summer schools for migrant children. In 1962 the State of Washington operated a pilot summer school for them, and Wisconsin operated summer sessions for all children to which they were eligible.

In spite of the fact that classes were held during the summer months when children were not forced to attend and when their wages were needed, the enrollments increased and many children returned the following year. Case studies in several of these States reveal that many children have been able to make up one or more grades of schooling. A 1962 report on the summer program in Oregon says that children who attended regularly for 3 weeks or more made scholastic gains of from 2 to 4 months, that two boys advanced a full grade in reading, and that all made some progress.

It has been estimated that 205 summer schools would be needed for the 20 States using the largest number of migrant workers with children (hearings on S. 1124).

Trends in migrant education

Progressive leadership is being exercised at the local, State, and Federal levels to improve the educational programs for migratory children. Increased public awareness of the need for improvement has stimulated research and study by various educational agencies. The problems of teachers and administrators in trying to provide opportunities for these children have made organization and coordination of educational services necessary at the local and State levels in some States.

Local leadership.—In order to provide for the seasonal impact of large groups of migratory pupils, some districts have organized small classes at the beginning of the school year so that the children can be absorbed without overloading classes. In some districts temporary facilities, such as gymnasiums, auditoriums, and music rooms, are converted into classrooms. Other schools change to double sessions in order to accommodate the migrants. Some districts have employed additional attendance officers to enforce the school attendance and child labor laws. Several districts have made agreements with other districts to transmit information on school transfer records.

State leadership.—In addition to providing financial assistance to districts for migrants' education, several State departments of education have designated staff members to provide leadership on the problem. Three State departments (Colorado, New Jersey, and Oregon) have full-time coordinators of migrants' education. Other States have staff members (mostly elementary supervisors) with divided responsibility for planning and coordinating programs to provide better opportunities for the children.

In at least 28 States, Governor's committees on migratory labor are concerned with housing, wages, transportation, schools, child labor, health, and other measures. Many of these committees have made considerable progress in these vital areas and in promoting correctional State legislation. Legislation for the education of migrant children has been enacted in nine or more States (California, Colorado, New Jersey, New York, Ohio,

[4] Subcommittee hearings, p. 9.

Oregon, Pennsylvania, Texas, and Wisconsin).

Federal leadership.—Because of the awakened interest in agricultural migrants and their families, national voluntary organizations have requested correctional legislation by the Federal Government. Five migratory labor bills (introduced by Senator Harrison Williams of New Jersey) dealing with child labor, education, health, crew leader regulation, and the creation of a national advisory council to aid migrants were passed by the Senate in the 1st session of the 87th Congress. The education bill would have provided financial assistance to the State and local committees for the education of migrant children during the regular and summer school sessions, for State and interstate planning and coordination, and for pilot projects on the education of adult migrant workers.

The health bill was the only one of the five bills approved by the Congress. It provides Federal grants for the next 3 years to finance clinics and health services for migrants. The clinics are scheduled at times and places accessible to the migrants.

Six migratory labor bills have been introduced in the 88th Congress. One of the bills would provide for improved educational opportunities for migrant agricultural employees and their children.

CHANNELS OF COMMUNICATION

A monthly report on programs and developments both in and outside the Office of Education that are related to the educational uses of television, motion pictures, teaching machines, language laboratories, and other media of communication.—SETH SPAULDING.

Federal funds now for ETV

On May 17 President Kennedy signed the Supplemental Appropriations Act for 1963, which provides funds for the program under the Educational Television Facilities Act of 1962. For details, see *Notes on the Notable,* page 3.

Many groups meet on media

Many leaders and specialists in the educational uses of the various media have been meeting this spring to plan studies and experiments in the uses of the media. In at least four of these meetings, staff members from the Educational Media Branch of the Office have participated:

1. National Institutional Research Symposium, Wayne State University.

2. The meeting of the National University Extension Association in Minneapolis.

3. The conference held by the American Association of Colleges for Teacher Education, to plan a national study of the role of the new media in teacher education. This is a 2-year study; it will have support under title VII of the National Defense Education Act (NDEA).

4. The national conference on the economics of educational television, held at Brandeis University. It has support under title VII and was jointly sponsored by the University and the American Academy of Arts and Sciences.

National Cultural Center

Although the facilities of the National Cultural Center are not intended to serve basically as broadcasting or film studios, the events that will take place there will be of much interest to the people of the United States and should be passed on to them through as many media as possible.

This is one of the conclusions reported from a study recently completed by the Telecommunications Center of the Ohio State University, under the direction of Richard B. Hull and with the assistance of a panel of distinguished consultants. The study, supported by a grant under title VII, NDEA, was commissioned by the board of trustees of the National Cultural Center as a source of assistance in determining policy for the Center's use of the new media.

Among the recommendations made in the report on the study are these:

That the National Cultural Center be designed to accommodate the new media without detracting from the appearance of the building or interfering with the pleasure of the audiences that attend the performances.

That space be provided so that the new media can be installed as required, under a plan that recognizes the needs of the present and anticipates the developments of the future.

That auditoriums and stages be designed for broadcasting, and provision made to cover events taking place in the corridors and approaches.

That the Center have its own television, radio, film, recording, audiovisual, and photographic equipment, and its own staff to operate it.

That policies and procedures depending on architectural considerations be determined before the Center is built, to avoid the need for expensive and possibly unsightly alterations.

Dr. Spaulding, at the time this issue went to press, was Chief, Research and Services Section, Educational Media Branch, Office of Education. In mid-June he left the Office to take up new duties at the University of Pittsburgh, where he will be associate professor in the School of Education and in the Graduate School of Public and International Affairs.

JULIA W. GORDON

Grouping and human values

IF WE TRULY VALUE the fullest development of each individual, then our study of grouping should be in terms of human values. The way we put children together in groups reveals how we regard human beings. Do we believe that human welfare and the welfare of our democratic society are best served by developing to the maximum the potential within each individual? Or do we believe that individuals are expendable?

Our direction must be clear. Dr. Melvin Tumin, anthropologist at Princeton University, has said that essentially the purpose of the tribal reunion was to rededicate its members to the highest ideals of the tribe, to consider "What is it we *would* do if we could?" This is the question to keep before us; then when we make compromises we will recognize them for what they are—expedients—and we can return to our proper direction as soon as possible.

Each time we ask "What is it we would do if we could?" we have a fresh opportunity to reexamine our assumptions, our basic values. Moreover, we can include new knowledge and new experience. A great deal of knowledge of human potentiality, for example, is available today that is not widely known or used. Margaret Mead has said that we continue to measure human beings by what they are and what they have been, not by what they can become. How should we work with each child if the way is to be left open to him to become all that he could become? This is an interesting question. And we do have some know-how that bears directly on the question of grouping children for learning.

Before examining the factors in grouping children for learning that will help each child realize the best in himself, let us see why this should be the aim of any grouping and what we know about human potentiality to guide us.

Human values

Why should we rank human values highest? We live in a democracy, an organization committed to the ideal of individual human worth. If our practice could come closer to the ideal, it would be our greatest strength. Yet we fall far short in our concern for individual human beings. This is reflected in the mounting toll of maladjustment in our society. In 1946 Arthur Jersild (in *Child Development and the Curriculum*, Bureau of Publications, Teachers College, Columbia University, New York) said, "If present trends continue, a large proportion of pupils in the average first grade will be in the ranks of the maladjusted at one time or another during their life span." In May 1960 I made a search to bring Dr. Jersild's 1946 figures up to date. This is the way they compare.

The estimates are that at some time in their lives, out of 100 first-grade children in—

1946	*1960*	
1 or 2	1 or 2	would commit major crimes and spend part of their lives in jail,
8 to 10	10 to 12	would develop serious mental illness and spend part of their lives in mental hospitals,
3 to 4	4 to 5	would be so retarded that they would have great difficulty in becoming self-supporting,
30 to 50	36 to 60	would have maladjustments taking such forms as petty crime, vocational failure, chronic unemployment, emotional instability, marital unhappiness or divorce, other forms of failure to make a satisfactory go of things.
42 to 66	51 to 79	totals

In an average first-grade class of 30 children, the prediction in 1946 was that 13 to 20 of them would be in the ranks of the maladjusted at some time in their lives; in 1960 it was 15 to 24 children. This represents an increase of 20 percent in 14 years.

It seems that our basic task must be to create those conditions and to provide opportunity for those experiences and relationships that will insure the sound mental and emotional development of each individual. To do this we need some understanding of human processes.

Human processes

What human processes do we need to understand? To understand a human being we have to go to research even in physics and chemistry—to the sciences that deal with matter as well as with living things. We see something like this.

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1. *The human being as an energy system.*—Quantum physics has made possible the view that all phenomena, from galaxy formation to human intelligence, form a single unitary process from simplicity to complexity and ever-increasing consciousness.

The same processes are condensed in the brain—the most densely organized unit of matter in our known universe. The cortex contains 10 billion cells and is capable of 10^{278} synapses. The speed of energy exchange in thought processes is incredible, and flashes of insight can occur in which long, cumulative past experience is evaluated at the unconscious level and the answer comes out right, and we know it is right. Moreover the immense number of possible synaptic combinations makes it inevitable that free creative thought should result.

We cannot know what increasing consciousness and creativity will result from the increasingly complex organizing of energy in man's brain. But we do know that man already has the potentiality for creating any kind of world he wishes.

2. *Perception and learning.*—A human being learns about his world through his sensory equipment. The brain organizes what he takes in into perceptions. The quality of the perceptions, whether or not what the individual perceives is actually so, depends upon the quality of his experiences. For example, if the organism actually lives through the experience, the information is built in and is more readily available later than information that comes vicariously. A simple illustration is Maslow's story of the two boys with Tinker Toy sets. One boy's father shows him what he can construct with it. The other boy works it out for himself. The first boy will arrive at an acceptable product sooner than the second, but the second will have built into himself invaluable bits of information that he can draw upon at will with understanding. The more a person's experience is of the latter kind, the more he can build in accurate information to use in dealing with new events more perceptively.

Because human beings have language, their learning can be hastened considerably. Not everything one learns has to be experienced directly. And herein is the problem. An adult with wide direct experience can learn accurately a vast number of things through being told or through reading. But what *children* can learn accurately in this way is much more limited. Yet, our society tends to shortcut the direct experience and to place increasing emphasis on vicarious modes of learning. The product may seem superior earlier, like the first boy with the Tinker set. But children by this means lose opportunities to accumulate information in which they can have full confidence.

Another thing happens if they do not have inner resources to draw upon: children come to mistrust themselves and their own experience. They have to look to others, to measures outside themselves, in order to evaluate themselves. The difficulty adults in our society have in giving up grades and marks attests to their necessity for this measurement of themselves and their children. How else can they know how good they are? Unfortunately, the more a child mistrusts his own experience, the less he will try new experience. He will have to wait to be told or to be guided. If he can trust his experience he will be eager to try out his accumulating powers. He takes an active, interested part in his own growth and development.

It seems to me that we should ask about the growing child: "What must he experience daily now so that what is built into him is accurate and sufficiently detailed to contribute to increasingly complex understanding later and to his confidence in his developing capacities?" and "When can he be helped to make a leap in learning without sacrificing the good of direct experience?"

3. *Emotions.*—A human being learns about his world in still another fashion, through feeling. In each experience he not only perceives the "facts" but also has feelings about them. His store of feelings accumulates as his store of knowledge accumulates. The accumulation of this qualitative experience influences what else he can allow himself to take in of his world, and what choices will be open to him in regard to future experience. It will allow him to perceive fully and to behave appropriately in the situation, or it will cause him to distort or select from his experience that which is protective of him.

Human beings can move in the direction of growth and fulfillment, or withdraw into safety. Growth and change involve risk. The more a person moves in the direction of growth, the less assuredly safe he will be. How great a risk he can take depends upon his view of the support of the people who are a part of his life and upon the strength of his values. If he is surrounded by people who can let him do his own experiencing to an appreciable degree as he is growing up, he can more readily move in the direction of growth. If, however, he is denied the support of those closest to him, or if all his experiences are rigidly directed, his safety needs most often will take precedence.

Yet, a person can withstand an inordinate amount of punishment from those around him if he is pursuing goals that have deep meaning for him, and if he feels he is moving toward fulfillment.

It seems to me that we should ask: "What must a child experience now so that he will be willing to take the risks involved in extending his capacities, in growing?" and "How much safety does he need to have in order to be able to take the risks?"

4. *Socialization.*—A human being learns about his personal relationship to the world through other human beings. A child cannot escape viewing the world and himself through the eyes of those who surround him. The process of acculturation is demanding, and yet it seems natural to the child. He experiences directly the life of the people who are closest to him. This is what becomes a part of him. For a time this is all the reality he knows. Thus patterns of culture are transmitted to succeeding generations. When differences come to be noticed, it is this early direct experience that seems "right," and what is different, "wrong." For many people this is the way it remains throughout their lives. Even for those whose experiences reach far beyond those of the childhood culture, it is the way of behaving they learned early in life that persists in being the comfortable one.

The possibility of fulfillment of any human being depends upon the quality of the people about him. For example, a child born into a home where the language is spoken well, speaks well naturally and easily; he knows no other way. But such is the circumstance of another child that he may spend half a lifetime in learning to use the language as well as the first child may use it at age 5. And in the conscious effort of maintaining this hard-earned means of communication, he may expend a tremendous amount of energy daily. In the meantime the first child has the opportunity, through his command of the language and his free energy, to realize more of human potentiality than the second child has opportunity to do. He may not make the best of it, but he has a long head start.

The accident of birth does not make the first child "better" or more worthy than the second. Both have a right to the opportunities for fulfillment of the best in themselves. But the second may be denied the opportunities if the standard of measurement at any point is the end product rather than effort and growth.

Questions we should ask, it seems to me, are: "What kind of experience with people must a child have daily so that he can have a realistic and healthy view of himself as a person in process?" and "What should be the quality of the experience so that the things that come to feel natural and 'right' to him are those ways of behaving that lead to his optimum fulfillment and contribution to the world?"

Factors in grouping

What are the factors in the grouping of children for desirable and effective learning? In the light of what has been said here about the nature of human beings, it is inevitable that the way people are grouped for any purpose has a deep effect on their development. The effect of grouping on children reveals what we truly value for children regardless of what we say we value.

In our democracy we have designed a system of education intended to reach every human being with opportunity to become all he can become. We are now reviewing that system in order to make changes in it. For what? If we believe in a democratic society, then there is only one answer: to bring our system of education closer to its stated ideals. The factors in grouping, then, must be in human terms and in individual terms.

1. *Grouping should be flexible.*—Since human beings are in the process of becoming more than they are, and since life processes are dynamic, school organizations should be "open" so that change can be incorporated at the moment it is needed. The structure should be so flexible that at any time we can change our ways of working with children in order to incorporate new knowledge (*a*) of the way human beings learn and develop, (*b*) of the world, and (*c*) of the educational processes that help us match necessary subject matter to the child's readiness to take it in.

The greatest enemy of change is categorization. Once we have categorized and classified, this becomes *it:* we have *the* answer and need seek no further. In our schools this may take the form of rigid courses of study used year after year in the same way or administratively expedient grouping of children, even though many children cannot find their proper place in the group. Dr. Geoffrey Esty, the medical consultant with the New Jersey State Department of Education, has an apt phrase for all this; he says the schools are suffering from the "hardening of the categories."

This is not to say that structure is bad or unnecessary. Structure gives meaning and wholeness to a collection of items or ideas. But it can only include what we have at the moment and should therefore remain temporary and open to include what becomes known.

2. *Grouping should be in terms of the purposes of the individual child.*—Whatever experience a child has as he grows must be meaningful to him as he explores it. If it is, he is more apt to trust it, to study it, to build the meaning into himself, and to become increasingly more self-reliant and mature. The more we try to do things *for* children, make their decisions for them, and prescribe what they should learn, the more we increase their need for safety, and the result is the opposite of what we really want to happen. The child finds it easier to do what is required of him than to take risks in discovering truths for himself.

It must not be forgotten that the *individual* child is the important unit. Grouping him with others is merely one means of creating an environment favorable to his growth.

3. *The basic group with which the child spends most of*

his day should be as heterogeneous as possible.—Just as the individual's early experience in his family comes to be what seems natural and right, so also does the school experience come to be what is right and proper schooling. It is important, then, that the school experience embody as nearly as possible the values inherent in the democratic ideal.

When every individual can vote, each individual with one vote has tremendous decisionmaking powers. Only he can make good decisions for all who understand the needs and aspirations of all, to whom the needs and aspirations of others unlike himself are as worthy of consideration as his own. This can only be achieved if he can be close enough to a wide sampling of different human beings to see their behavior as natural and understandable.

Inevitably, when people alike group themselves and do not know what is going on in the other groups, they tend to be distrustful and suspicious of the others, to raise protective fences and close themselves in ever more tightly. There is, it seems to me, no place in the public schools of a democracy for anything that separates us.

If children are to build on the facts that make it possible for them to perceive accurately what people are really like, they need to grow up with as wide a variety of other children as possible. Every effort should be made to supply opportunities for this experience in the daily living of the basic classroom unit. Since growing children are different at various age levels, I believe a child gains self-understanding as well as understanding of others if his class represents a variety of ages.

To deprive children of this basic experience with all kinds of human beings is to deprive them, perhaps for their lifetimes, of the human understanding it teaches. If they are to learn this later, they will have to do it consciously and with a great expenditure of energy. In our present age we can ill afford to leave human understanding only to those who will make the effort to understand. Such an elite won't save us.

4. *The number of children in the basic classroom group should be small enough for face-to-face encounters.*—In a group small enough for children to move freely in, choices are made. Children size each other up and choose each other for a variety of purposes. Working and playing together, in close contact with others, each child must suffer the consequences of his acts. Since other children react to him directly, he can perceive what his acts mean to others. He can explain if he feels he has been misunderstood, or he can change if he feels he has been mistaken.

In addition, in a small enough group other people's actions are so close to him that he must take them into account. When a child has many experiences of this kind with a wide sampling of people, he has more facts available to him, and therefore can perceive situations more wholly and accurately, and thus behave more effectively. The accuracy and keenness of his perceptions open up new possibilities for behavior at a new high level. More choices are available to him; he is less bound by rigid cultural patterns.

5. *Essentially the same group of children should remain together for a long enough time to develop a stake in each other's welfare and growth.*—In small groups, where face-to-face encounters are inevitable, children readily see the consequences of their acts. This tends to make them more responsible for their behavior. When a group of children begin to feel responsible for their behavior, they can learn to develop, through time, a good society for themselves. Such values as understanding of self, compassion for others, a feeling of oneness with others can emerge. Time and closeness to others are indispensable factors in understanding.

6. *Each child should have time alone to strengthen his trust in himself.*—While a child cannot have a realistic view of himself or a sense of responsibility apart from others, the ultimate responsibility for his behavior rests with him alone. He needs time alone, after taking in the world, to contemplate what he has, to give it meaning. He needs time alone to work at stretching his own powers, to pursue his own goals. He needs to work at what is important to him even if no one else wishes to work with him. Dr. René Dubos, biologist at the Rockefeller Institute, has said, "Anything that forces a man to function against his goals becomes the cause of the bodily or mental disease. Man can overcome even the most painful limitations and handicaps to the extent that he is functioning in a manner that corresponds to fulfillment."

It may well be that the statistics on the increasing rate of human maladjustment reflect the fact that we do not allow growing human beings to learn to define their own goals and to work toward what seems important to them.

A human being must maintain his aloneness. His best interests, as well as the best interests of society, are served if the integrity and honesty of each individual are preserved. It is the individual who must make the choice or decision in the light of the best experience he can have. The seeds of human destruction are sown when he turns this responsibility over to another or to something called "the group." The group can only supply him with necessary facts for more accurate perception of the total situation. If he can remain "open" to what he perceives, he can make wiser decisions.

7. *Each child should have opportunity to share what he has with his peers and be challenged by them.*—As a human being discovers his potential and as he is able, through experience, to open up new potential, he has to

communicate his discovery to someone. Nothing encourages a person more than to find someone who completely understands what he is talking about because he, too, has been through a similar experience. The child who plays the French horn well, or the child who can throw and catch a swift ball, is joyful when he can perform with others whose performance is at the highest possible level. This is a powerful uniting factor.

Under such conditions, the performers can enter into friendly competition with each other to match or exceed each other in competence. They compare notes on what they are practicing, how well they are doing. They give "trade secrets" to each other, revealing how they discovered a better way. To do well and to keep improving become important personal values. And because the enterprise binds them together and the achievement of one makes possible further growth for all, they come to accept the value of helping each other become more competent.

Children can perceive these things most keenly if they leave a widely heterogeneous group for a while each week to work with their true peers toward goals they consider important. As a result, each child learns to recognize the extent of his own ability. When he is back again in the heterogeneous group, he has the opportunity to perceive his true position of relative competence.

If children are kept with their peers in ability all the time, they cannot get the perspective they need for a true assessment of themselves. Consequently, relationship with their equals in ability can become a threatening thing. Competition to maintain status in the eyes of the adults controlling the situation becomes a divisive force rather than a uniting one among such children. It is true that many persons can achieve a high degree of intellectual competence by this kind of pressure. But all that is known about the nature of human beings suggests that if children could be helped to perceive themselves and their world realistically, we would have all the intellectual competence we need, and, in addition, wisdom and lovingkindness as well.

8. *The position of adults concerned with grouping should be such that the other aspects of grouping may be advanced.*—In view of what has been said about culturation, perhaps the best start toward fulfillment of his potential that we can give each child is to put closest to him in his daily living adults who embody human values. The teacher closest to the child would see him as a person in his own right, preserve his integrity, and allow him to grow in his unique way, eventually to make his unique responsible contribution. This teacher is the one who makes sure that the child is developing an integrated, whole, and healthy personality. Then other teachers can come into his life for other purposes.

The evidence from many sciences indicates that the human values we have been talking about here cannot be transmitted in large, impersonal groupings. Yet the suggestion is being made that we put the "best" teacher, the master teacher, in just such a situation, and the less-than-master teacher closest to the child. My guess is that insufficient thought has been given to the learning processes of children.

Let me give just two reasons of many why children learn little when they are taught in a large audience situation. The first is that many children who have defects in visual or auditory acuity, coordination, perception, problem-solving ability, and certain aspects of behavior do not learn much when they are in a large audience situation. What has been taught there has to be retaught later in a small group. The second reason is that the children who are least disposed to change are the ones least likely to allow themselves to learn anything from it.

Face to face with each child in a small group, a teacher can get feedback from the child and perceive his reaction, and she is in a better position to be helpful to the child. Teaching in a large audience situation, if the goals of education include the healthy, unique, responsible development of each child, is at best a waste of time and, at worst, seriously damaging to the child's concept of what constitutes learning.

One other aspect of the position of adults in the grouping of children needs to be considered here. It is true that no one teacher can be all things to all children. The classroom teacher may find it necessary to call upon other teachers for help, both for herself and for individual children or groups of children. She may call on other classroom teachers, or psychologists and other specialists in human development, or subject-matter specialists.

A small group of teachers may plan together, helping each other learn what is needed, and pooling their special competencies. Occasionally each teacher will work with individuals or small groups of pupils in other teachers' classrooms, whenever the human purposes are best served by doing so.

The chief value of the subject-matter specialist is not that he knows more subject matter to "pass on" to children but that he has a larger perspective in one area. He can hear and understand and use what a child is saying to him in helping the child take the next step. When a child begins to synthesize an accumulation of knowledge, the specialist can help him to be conscious of the processes he is using. He can help him to be aware of the discipline of the subject.

Children are at different levels in the various subjects, and they progress at different rates, erratically. It is hard

to see how a subject-matter specialist can work with a large group or an entire class very often, any more than the classroom teacher can. His most effective use is with single individuals and with small groups, and with the classroom teacher, particularly by broadening the classroom teacher's perspective.

If the classroom teacher is to help each child integrate his experiences, he must know in some depth what these experiences are. The classroom teacher can learn about these experiences by being present when the children are with another teacher, and by frequent conferences with others who also work with the children.

And so, if we truly value the fullest development of each individual, our ways of working with children must be in terms of human values. We must do what we can to help each child realize the best in himself.

Statistic of the Month

Increasing enrollments in vocational education

The number of persons receiving training in public vocational education programs has reached and passed the 4 million point. The 1 million point was reached in 1931, the 2 million in 1939, and the 3 million in 1949.

Of the more than 4 million persons who in 1961–62 were enrolled in vocational education programs of less-than-college grade in public day schools and in public education programs for out-of-school young people and adults, 42 percent received training in home economics, 25 percent in trade and industrial fields, 20 percent in agriculture, 8 percent for distributive occupations, 4 percent for technical occupations, and 1 percent in practical nursing.

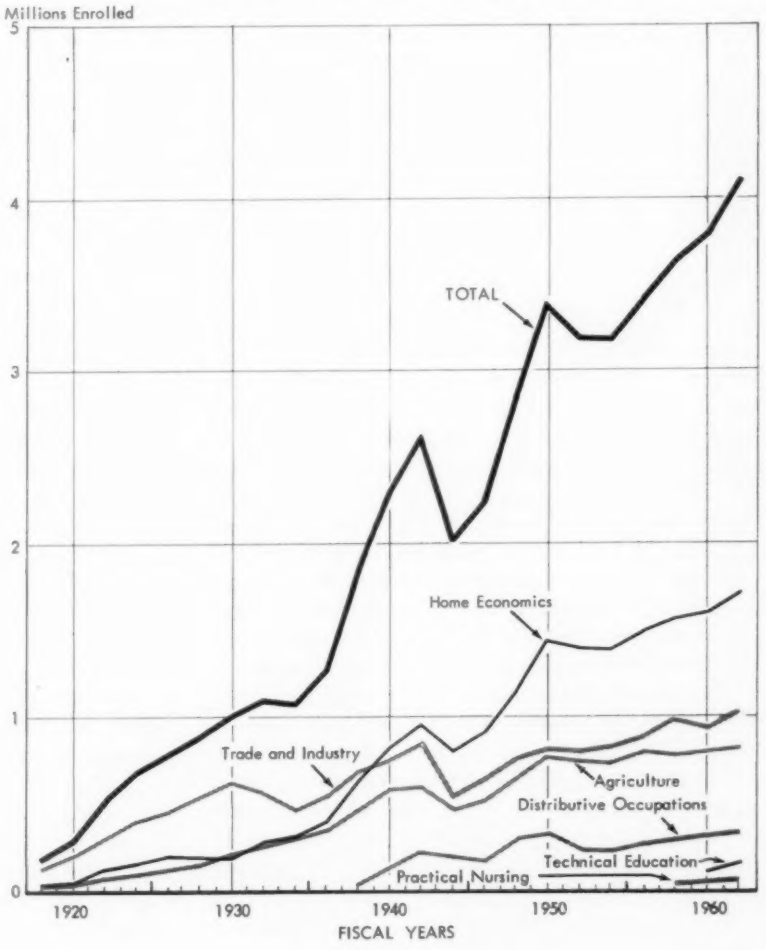
All the programs in which these persons were enrolled receive Federal funds. Federal funds for vocational education of less-than-college grade have been allotted to the States annually since 1918. They have been authorized under the Smith-Hughes Act of 1917, the Vocational Education Act of 1946, usually referred to as the George-Barden Act, and supplementary legislation enacted since 1917. As the chart shows, the programs in practical nursing (authorized by the 84th Cong. in title II of the George-Barden Act) and technical education (authorized by the 85th Cong. in title VIII of the National Defense Education Act) are the most recent additions to the list of programs receiving Federal support.

The legislation authorizing Federal funds requires that each Federal dollar be matched by State or local dollars be used for the same purpose. The amount of State and local funds far exceeds the amount of Federal funds. During 1961–62 Federal funds for the Nation as a whole amounted to $51,438,000 or 18 percent of the total; State funds, to $104,264,000 or 37 percent; and local funds, to $128,246,000 or 45 percent.

Forty-seven percent of the persons enrolled in 1961–62 were in day classes, 45 percent in evening classes, and 8 percent in part-time classes. By type of program, the distribution was as follows: *Agriculture*, 58 percent day, 33 percent evening, 10 percent part-time; *distributive education*, 86 percent evening, 14 percent part-time; *home economics*, 62 percent day, 35 percent evening, 3 percent part-time; *trade and industrial*, 55 percent evening, 29 percent day, 15 percent part-time; *practical nursing*, 72 percent day, 28 percent evening; *technical education*, 64 percent evening, 36 percent day.

The source of these data is *Digest of Annual Reports of State Boards for Vocational Education, Fiscal Year Ended June 30, 1962*, Office of Education, U.S. Department of Health, Education, and Welfare (OE–80008–62).—Rose Marie Walker, educational statistician, Office of Education.

Enrollment in Vocational Classes by Type of Program



STAFF OF THE ELEMENTARY SCHOOL SECTION
OFFICE OF EDUCATION

The elementary school in the city—a conference report

THIS IS THE SECOND HALF of a report of a conference held in Washington this spring, at which elementary school supervisors from 64 large cities met with the staff of the Office of Education to discuss common problems, to ascertain and study trends, and to plan for improvement of the elementary school. The first half of the report, published in last month's issue, covered the discussions that considered especially the disadvantaged child and the status of and changes in administration and organization.

Curriculum

The discussion on curriculum was prefaced by three summary statements about the present state of affairs and the changes taking place in the language arts, mathematics, and the social studies. Each statement was made by an Office of Education specialist in the subject; an abstract of each follows.

THE LANGUAGE ARTS

Helen K. Mackintosh

Chief, Elementary Schools Section

The schools have changed their point of view on the language arts. Once they thought of them as existing in separate compartments—as reading, literature, spelling, handwriting, oral expression, and written expression. Now, however, they are thinking of them as parts of a whole: the emphasis is on communciation, which encompasses all these forms of expression and others.

Within this context of interrelationship and coordination, however, different groups are emphasizing different things. Everyone in general—the educator, the scholar, and the man on the street—is emphasizing the teaching of reading and the improvement of written expression. The scholars are emphasizing the importance of linguistics. Parents are caught up in the controversy about the age at which young children should learn to read. Teachers who see their job as one of teaching children to listen, to speak, to read, and to write, think of the language arts as the common carrier for the whole elementary school program.

Despite the many different points of emphasis, however, and partly *because* of them, everyone—teacher, parent, and citizen—should consider today's need for persons with well-developed communication skills, both oral and written; for these skills are the heart of any language arts program. At the same time he should remember that children follow a natural and logical sequence as they develop these skills.

First, the child listens. He begins to listen when he is an infant and does much of his early learning through his ears. By the time he comes to school, if his home background has encouraged him, he is already able to listen for a purpose; he is also able to speak, probably as well as the adults in his immediate environment. But the teacher who assumes that every child who comes to school already has these skills assumes too much. Unless the child has had many opportunities to listen and to speak and has had help and guidance from adults, he is not likely either to listen or to speak as well as he could or as well as he needs to.

Next, usually after he enters school, the child learns to read; then he learns to express ideas in written form. Each of these is a complex skill requiring the child to have many smaller skills: To be able to read aloud in such a way that he communicates with those who listen to him, to interpret the thought on the printed page, and to organize ideas for presentation.

All four skills—listening, speaking, reading, and writing—are basic to communication, but the average person uses some more than others. He probably "listens" a book in a day, speaks a book in a week, reads a book in a month, and writes a book in a lifetime.

Against this background, let us consider a few of the interesting developments taking place in the language arts.

One of the most significant is a joint project being carried on by the Association for Childhood Education International, the Association for Supervision and Curriculum Development, the International Reading Association, and the National Council of Teachers of English. All four have found that the skills of listening and speaking, both so basic to a child's progress in school, need more attention; and they have decided to prepare, through a joint committee, a bulletin calling attention

to the importance of teaching the elementary school child to listen for a purpose and to speak effectively.

The committee—each organization appointed four persons—met for the first time in January; they will probably have the bulletin ready early in 1964. To the supervisor concerned about reading programs in particular and language arts in general, this joining of forces to emphasize listening and speaking has great significance. Not only will it strengthen the place of these two skills in the elementary school curriculum but it will underline the importance of the total language arts program.

Another development is the controversy about reading. Educators have the responsibility for examining the many varied proposals for innovations, in the light both of experience and of sound principles of education. Institutions, organizations, and individuals in and out of elementary education are discussing ideas, methods, and procedures. One has only to mention such topics as the Augmented Roman Alphabet (now labeled Pitman's Initial Teaching Alphabet), the Denver Study, Yale's Omar K. Moore, the revival of the Montessori methods, the Barnhart-Bloomfield story, or R. Van Allen's method of teaching reading, and he is at once in the midst of a spirited discussion of philosophy, theories of child development, and conflicting opinions on the teaching of reading.

As the educator looks at these several programs, as he reads about them and studies them, it is important that he keep in mind the children with whom they will be used. To gain an understanding of all the innovations and proposed changes, to know what they have been planned to accomplish, to analyze their strong points and their weak, and to consider them in the light of local circumstances—all this requires much of the elementary school supervisor, both in time and in concentration and judgment. Supervisors in large city school systems may well ask themselves certain questions with their own specific situations in mind:

> Are there areas of agreement in language arts which a group of educators with long experience may define as a basis for their study of and experimentation with these programs?
>
> Is it possible to use dramatization or demonstration rather than words alone to clarify or explain a point of view in teaching methods in, say, the teaching of handwriting?
>
> Is it possible to enlist local groups such as the American Association of University Women and the League of Women Voters to make objective studies in communities where there are conflicting points of view about the language arts curriculum?

Another significant development in the language arts is the emphasis on linguistics; on all sides we hear discussion about the influence it may have on the content of school readers as well as on the study of spoken and written language. Linguistics is concerned with the structure of a language and with the translation of oral speech into written symbols; the position and function of the word in a sentence, rather than a definition of it, determines its classification.

One has only to take a group of words such as *horse, beautiful, quickly, the, rider, young, the,* and *threw* and put them together in as many different sensible ways as possible in order to see the importance of word arrangement in expressing an idea. Such an exercise can be the starting point for a study of linguistic theory.

Other evidence of the increasing interest in the language arts is Project English in the Office of Education. The project, which came into being early in 1962 as one part of the Cooperative Research Program, has resulted in the establishing, in universities across the country, of nine curriculum-development centers in English or the language arts and several demonstration centers. In addition, projects previously initiated under the general cooperative research program now are considered part of Project English if they represent any of the language arts. Two such projects begun several years ago and now completed have significance for language arts in the elementary school—Ruth Strickland's project and Walter Loban's.

Dr. Strickland conducted her study with 575 children from grades 1 through 6 in schools in and around Bloomington, Ind.—rural schools, smalltown schools, and the laboratory school of Indiana University. At intervals throughout one school year she and her team of workers taped the natural informal language of children in each of these grades. At the same time they made samplings from four series of reading textbooks to get at the structure of current textbook material. Then, using a formula set up by a committee of linguists, they analyzed and compared the children's speech with samplings from the textbooks. The findings showed, among other things, that children's oral language is "far more advanced than the language of the books in which they are taught to read."

Dr. Loban's study also deals with children's spoken language but on a different time schedule. His study began with 338 kindergarten children in Oakland, Calif., and followed them from year to year; by the time they were in the sixth grade, 241 of the children were still in the study. Each year Dr. Loban made a recording of each child's spoken language; each conversation was about one of a series of six pictures, and the same pictures were used each year. He also collected many different kinds of evidence about each child, which he used in analyzing the characteristics of the child's oral expression from year

to year. Of the many findings from the study, I mention only one: The child's progress in reading, in writing, and in oral language showed positive relationships with each other.

Both of these studies have produced results that should encourage teachers to search children's oral expression for both content and quality and to examine carefully the materials the school provides for their work in reading and language.

These developments are signs of the times, which clearly emphasize our need to be openminded as we study and evaluate new developments in the language arts in the light of what we know about how children grow and develop during the elementary-school years.

Mathematics

Edwina Deans

Specialist, elementary school mathematics

What, exactly, is new in the so-called "new" mathematics?

Before we try to answer this question, let us examine the characteristics of three pairs of programs currently in experimental use in elementary schools.

1. Two programs that are trying to make mathematics more mathematical are the program developed by the School Mathematics Study Group under the direction of Edward G. Begle and the program developed by the Greater Cleveland Mathematics Program under the direction of George H. Baird. Both aim at presenting mathematics in such a way that the pupil will develop an interest in it and an understanding of it that will persist throughout his lifetime.

Both emphasize the importance of a precise mathematical vocabulary. *Number*, for example, does not mean the same thing as *numeral*, and from the beginning the child learns to distinguish between them.

Both are trying to find the answers to these questions: Why are we doing what we do? Why is this law, this principle, important? How does it help the child to learn?

Both programs emphasize reading: the child is encouraged to find the answers to questions for himself.

Both include a substantial use of number lines. Both interweave strands from a number of mathematical subjects: they include, for instance, some of the basic principles of geometry and algebra, as well as a good deal of material on sets, factoring, and prime numbers to help the child learn operations with whole numbers and fractions. Both emphasize mathematical "sentences," or equations.

Each of these programs includes all the mathematics we have always taught in the elementary school, plus some new things. Both plan to have, eventually, complete programs for grades 1–12, but so far they have come only part of the way. Like all of the new mathematics programs, they search for patterns that will recur.

2. A second pair of programs that are similar to each other is the University of Illinois Arithmetic Project, developed under the direction of David Page, and the Syracuse University Madison Project, under Robert Davis.

Unlike the preceding two, they are not complete programs. They have taken only a few strands and are intended to be used as supplements to a regular mathematics program.

Both are heavy on algebra and make much use of frame arithmetic as a way of introducing the child to the use of letters and to algebraic thinking. Both also include equations, number lines, and patterns.

Neither places the same emphasis on precision as the first pair do. Rather, they emphasize generalizations, the big ideas that the pupil will meet over and over again in one form or another as through the years he continues his study of mathematics.

Of all the programs, these two have been most ingenious in using the "discovery approach" to mathematical facts and principles, of leading the child to do his own thinking, searching, and finding. Both emphasize oral teaching to stimulate children to think and to discover facts and principles for themselves. The writers of these programs have found ways to teach children things they usually are not taught until they reach the junior high school, or even later.

3. The programs in the third pair both originated at Stanford University—Patrick Suppes' and Newton S. Hawley's. Suppes presents addition as the joining of sets, and subtraction as the finding of the difference between two sets; and he has been successful in overcoming the zero difficulty. Hawley's geometry is heavy on construction. Although some consider it to be a bit too heavy for young children, the teaching of geometry to young children seems soundly based: after all, the world is filled with geometry and even a first-grader can see examples of it all around him.

Both of these programs, like the preceding pair, are only parts of a complete elementary school program; they are supplements to programs already in use. Although any supplementary program poses a problem for the busy teacher, who already has trouble getting everything into the schedule, it is entirely feasible at the elementary school level to take any good program and introduce, or graft, new mathematics into it.

Most of these programs are light on applications. If we can do a good job of teaching the generalizations,

they say, the applications will take care of themselves. In this they are at the opposite ends of the scale from the program developed by the Minnesota National Laboratories, under the direction of Paul Rosenbloom, for the School Mathematics Study Group—a program which in its stress on applications goes in for correlating mathematics with as many other subjects as feasible.

These three pairs of programs, taken together, include much of what we are calling new in mathematics today. How much of it is really new?

The meaning, for one thing, is not new. Take number lines, for example: we've been working toward these for the past 25 years. McLelland's and Dewey's *Psychology of Number and Its Applications to Methods of Teaching Arithmetic*, published at the end of the 19th century, is full of number lines.

Nor is the "discovery approach" new. Much of the work done on mathematics in the past was done with this method in mind—to encourage and stimulate the child to discover things for himself. The discovery method has long been emphasized in good teachers' manuals.

Nor is the emphasis on structure altogether new. Isn't emphasis on structure the very basis of what we long have called "spiral teaching"? Long ago we selected the basic principles of mathematics, and we have taught them—or at least hinted at them—in their simplest form to young children and then, as our pupils have advanced from grade to grade, we have gradually added the complexities.

Nor is the study of sets entirely new: sets are what we used to call groups. Sets, however, are an improvement over groups: the idea behind them grows more useful as the child goes on: there are more ways of applying it; and it represents a better way of organizing the material.

The expanded content, however—*that* is new. Never before have we begun so early in the grades to lead children into the experience of studying and analyzing geometric figures, into algebraic thinking as an aid in learning arithmetic, into work requiring logical reasoning and the showing of proof. Never before have we attempted to help children so early to understand so much of the structure of number systems.

Another new development is the breaking down of barriers between grade levels and the cutting across of grade lines. What does this change mean to the teacher? One fact is clear: the teacher must do a better job of individualizing instruction so that he can encourage the able child to advance and will not push the slow child beyond his capacity—in short, so that he can help every child to develop according to his potentialities. Only by attending closely to each child and noting the quality of his work can the teacher diagnose his pupils' difficulties and evaluate their progress.

Even though much of the new mathematics is not new, some of it *is*; and it does represent a new search for improvements in the curriculum, in materials, and in teaching methods. And the spirit of it is new. For these reasons the "new" mathematics means new responsibility for the elementary school supervisor.

There is enough newness in it to demand much inservice education for the teacher. Fortunately, elementary school teachers are now psychologically ready for something new and will welcome the opportunity to learn about it. At the same time, we as supervisors must show them that the "new" mathematics is not so new that it is beyond their ability to master it. The big change is that more is being taught earlier; and this is a change I think will please most teachers. Kindergarten and first-grade teachers, most of them, would be happy to have more to chew on.

Content is being examined more closely than ever before. New textbooks and new editions of textbooks are coming off the presses faster. There is an abundance of guides and courses of study. Everybody is trying to help the teacher; in effect, each of the new programs has an inservice program built into it.

Some supervisors may be tempted, in the face of all the changes advancing from every side, to say, "When are *They* going to get together to tell us what to do?" But *They* are *we;* and it is our responsibility to study the materials, the children's needs, and the teacher's problem. The responsibility rests largely in supervisory hands.

Social Studies

Wilhelmina Hill

Specialist, social science

What is happening in the social studies is no revolution, but it is something of a renaissance. Changes are taking place so fast in our society that constant planning and revision are needed to keep the social science curriculum up to date and the methods of instruction efficient and effective.

The increased rate of change that is a phenomenon of our times affects each person not only in his relations with his physical environment but in his relations with his fellow men. Consider, for example, these changes:

The tremendous increase in the number of nations getting their independence.

The growing tensions and complications in international affairs.

Technical developments—the coming of automation, for example.

The speeding up of communication and the growing technology of communication.

The increasing mobility of the population.

The beginning of the space age.

Each one of these calls for changes in our social studies program. What are schools doing to bring these changes about? What signs are there that educational agencies are alert to the need for keeping the social studies program abreast of the times and broad enough and deep enough to prepare children for life in the world as it is and is fast becoming?

1. For one thing, many schools and several States seem to be keeping a realistic and appraising eye on the changes taking place in society as they develop their social studies programs for the primary levels. At least the content of these programs is not so watered down and thin as it once was. For example, the State department of education in Virginia has published a new curriculum guide for the primary grades, which recommends that the schools reach out for a broader range of subject matter as they teach the social studies to young children. This curriculum is far out in front: it includes geography, international relationships, and the meaning of citizenship.

2. Most elementary schools are trying to help children develop understanding of other people. Kindergartens begin with projects that center on the toy store, the zoo, the home, and the airport, and provide a natural stimulus to a child's curiosity: Where was this made? Where did this animal come from? Where are these people going? What are they doing?

In one school in Fairfax County, a collection of seashells from all over the world has been exceptionally productive of ideas for opening children's minds to the world beyond their own. Denver has an imaginative first-grade unit on "Other Places." Many second grades have good units on neighbors, and more and more these units are being expanded to include neighbors in other countries. In the third grade many of the units on "Our Homes" have been enlarged to "Our Homes and Homes Around the World." Units on food, clothing, communication, transportation, and communities also are aiming at worldwide coverage.

The increasing attention to international understanding shows up over and over again in all grades from kindergarten through grade 6 in the excellent teaching that is being done about the United Nations and its related organizations. Nor are the schools neglecting opportunities offered them in connection with such international organizations as the Boy Scouts, the Girl Scouts, and the Junior Red Cross.

3. More emphasis on geography is part of the renaissance in the social studies. It is a natural concommitant of the space age and the speeding up of communication among all parts of the world.

Some States and cities—Florida, Virginia, and New York City, for example—have prepared excellent guides for the schools to use in teaching children how to study maps and globes. And now the National Council for Geographic Education has completed a curriculum guide, in which the whole structure of geography has been analyzed so that teachers and curriculum makers will have a foundation on which to build well-balanced and logical geography programs. [*Curriculum Guide for Geographic Education*, available for $4 from the Council's Publication Center, Illinois State Normal University, Normal, Ill., 1963. Dr. Hill is the editor.—ED.].

More geography is being taught at all levels. Certainly the primary levels can do much more than they have in the past, for many geographic concepts can readily be taught to young children. In the kindergarten, for example, we can begin to teach the concept of globalism—that concept so necessary to an understanding of geography at any age; children who have seen on television something about the orbital flights of the astronauts already have had an introduction to it.

4. Economic concepts are being taught in a more orderly and effective fashion in many schools.

5. Curriculum makers are enlisting more aid than formerly from scholars in the several social science disciplines: it is encouraging to see, for example, the interest with which social studies teachers are receiving the ideas of anthropologists, economists, and geographers. It is true that the final decision about what should go into the curriculum is the responsibility of supervisors and teachers and curriculum experts, but all of these persons can learn much from the scholars and should, above all, keep their minds open to the scholars' suggestions.

6. Project Social Studies, which the Office of Education initiated last fall with funds provided under its cooperative research program, has approved three curriculum study centers so far, one of them including the elementary school. They will be carried out, over a 5-year period, at Harvard University, Carnegie Institute of Technology, and the University of Minnesota.* The Office also has funds available for basic and applied research on the teaching of the social studies.

IN THE DISCUSSION that followed, the supervisors revealed something of the extent of the pressures they are under to revise the curriculum in one way or another, in one subject or another. Some seemed inclined to think

*Since Dr. Hill made this statement, four more centers have been approved under Project Social Studies. See the review beginning on p. 25.

that most of the pressures resulted from misinformation about the school or from lack of information. "I'm convinced," one supervisor said, "that much of our trouble stems from our not having told our story well enough. We haven't even kept our superintendents informed: some of them probably think their schools are *full* of the horrible examples that get called to their attention." Others of the conferees said that school people—teachers, supervisors, and administrators alike—were responsible for yet other reasons: that some had not kept abreast of change, had even resisted change; that some had no good reason for doing what they were doing, but were simply doing as they themselves "had been done by." All agreed that the best guarantee of a sound curriculum was to be sought in the intelligence, knowledge, and judgment of the teacher and of those who supported him—the administrators, the supervisors, and the parents.

Most of what the supervisors went on to say centered on the ideas suggested by the three preliminary statements, though some of it touched still other topics more or less related to the curriculum. What follows is a collection of some of the comments, roughly grouped under a few large headings.

Linguistics. Linguistics is going to have a strong impact on the teaching of language arts, and we in the elementary school are going to have to learn what contributions it can make and how we can use them to the greatest advantage. Our professional journals are publishing a great deal of information on the subject; and we can get a basic point of view from reading such materials as the introductory pages of *Let's Read* by Bloomfield and Barnhart.

Reading. Reading—what a tremendously complicated learning problem it represents for a child! We recognize that it is so, and we must find the best ways of helping him master the complexities. His failure to master them will be disastrous for him: someone has said that a child's failure to learn to read has the same impact on him as going into bankruptcy has upon a man.

—The tragedy is that many children come to our schools so lacking in vocabulary that we have little to work with.

—But do they really lack a vocabulary? Maybe we're the ones who are at fault: we don't know the child's vocabulary and he, because he knows that our minds are closed to his language, doesn't speak to us—doesn't even try to. Some schools have abandoned the assumption that there's nothing to work with and have been rewarded: in Detroit, for example, in one of the Great Cities projects, they have worked out a new way of attacking the problem. Reading supervisors and teachers have worked together to prepare primers and preprimers that use the vocabulary the children bring with them.

—No; in *our* school it is really a *lack* of vocabulary. In our schools we're working with small children who have hardly any words at all.

—Lack of vocabulary can be put another way—as lack of experience. Some children simply haven't seen, or heard, or felt, or tasted enough: everybody has to experience a thing in some way, if only vicariously, before he can have a word for it or understand somebody else's word for it.

Sex differences in reading. Boys seem to have more of a problem in learning to read than girls do. In our schools we have found the ratio in remedial reading groups to be 8 boys to 2 girls.

—In Germany, where education is male oriented, the situation seems just the opposite. In the United States the fact that most teachers of young children are women may have something to do with it. If we had more men teaching in the first grade, the effect might be the opposite.

—I don't know that it would be *exactly* opposite. Girls feel better about themselves all along: they have a happier image of themselves.

—In Los Angeles we are beginning an experiment in which we are separating the boys from the girls, and we may gain some information that will throw more light on this matter of sex differences.

Instructional materials for mathematics. There are a great many devices and materials on the market, and nearly all have something to recommend them. But let us not assume that any one of them will do everything. The point to remember is this: Each device is, after all, only one device; and a good mathematics program, which is designed to present and interrelate many ideas, will use many devices and many materials, each only for the purposes it serves best.

Inservice training for mathematics teachers. One of the most effective devices for inservice training is to demonstrate, *with children*, the teaching of a mathematical idea. In Washington, D.C., two mathematics teachers spend all their time going from school to school and putting on demonstrations.

—Inservice training is particularly important for the teacher of elementary school mathematics. When he was in college, he got mathematical background—this, after all, is the principal objective of most college courses for teachers of mathematics—and he needs additional training in methods of presentation and supplementary information to help him adapt to the changes taking place in elementary school mathematics.

—But the teacher isn't the only one who needs inservice training to introduce him to the "new" mathematics. The principal needs it too, for he is the one who will face

any public relations problems that may arise when changes are made—or not made.

—Principals are being systematically informed in at least one city. The mathematics supervisor has set up pilot projects in each of the several regions in her district where she puts on biweekly demonstrations—to edify principals as well as teachers.

Applications of mathematical principles. What about the applications—should the elementary school teacher play them down?

—It's true that some programs in, say, the 7th and 8th grades have been overloaded with applications. But I don't think that in the elementary school we've ever had enough applications to hurt anyone; that is, we've not used them at the expense of the principles. Whenever we do use applications, we should be careful to use them *mathematically*. Some textbooks have been successful in marrying the two—the principles and the applications.

Economics. In what ways is economics getting into the elementary school curriculum?

—In vertical strands that run through units on other topics and appear and reappear at appropriate times. I've not seen many units specifically devoted to economics, though ever so often you'll find units on conservation based on economics or, as another example, units based on the stock market.

—In Michigan there's a State committee working on economic education that doubtless will consider both the elementary and secondary school curriculum. I do know that they have been interested in selecting, from children's literature, portions that would be useful in teaching the ideas of economics.

THESE COMMENTS, however desultory they appear as a result of their having been cut out of the fabric of discussion, express some of the problems—and suggest many others—that complicate the professional lives of supervisory and instructional staff members in the public schools. In the 2 years that will pass before the Office of Education again calls this conference, some of these problems will come closer to solutions and new ones will certainly arise: problems, like other aspects of the elementary school, are subject to change.

One idea, however—one that dominated the conference discussions—is not likely to change. It is the idea that the times make exceptional demands on the schools and on every person in any way responsible for the effectiveness of a school. The times, the conferees agreed, have put a special premium on the educator's attentiveness: the educator must know his objective and he must know the way to reach it—or he will be lost in the woods.

BONDS

for educational purposes

. . . sales, interest rates, et cetera . . .

Public Schools

By ELMER C. DEERING, *specialist on the financing of school facilities, Division of Elementary and Secondary Education, Office of Education.*

IN 1962–63 VOTERS SET a new high record in school bond elections: They gave approval to a total of $1,838 million—$64 million above the previous record of $1,774 million in 1959–60. And 1962–63 may prove to break yet another record set in 1959–60—in the amount of school bonds submitted to the voters. We do not yet have reports on a number of scattered elections, but the latest tabulation shows that $2,642 million was submitted to vote in 1962–63, which is only $29 million less than in 1959–60.

The following tabulation compares school bond elections in the past 5 school years (previous reports—*School Life*, May and November 1962, February and April 1963—have been for calendar years, in order to compare school bond elections with other municipal bond elections):

School year	School bonds voted on (millions)	School bonds approved (millions)	Percent approved
1958–59	$1,799	$1,433	79.7
1959–60	2,671	1,774	66.4
1960–61	1,612	1,226	76.1
1961–62	1,849	1,273	68.9
1962–63	2,642	1,838	69.6
Total	10,573	7,544	71.3

Bond sales for public school purposes in 1962–63 exceeded $2 billion for the fourth consecutive year. When all reports have been received, 1962–63 sales will probably reach $2.278 billion, $290 million below the record high of $2.568 billion in 1961–62. Sales of school bonds in the past 5 school years were as follows:

	Sales in millions
1958–59	$1,948
1959–60	2,195
1960–61	2,357
1961–62	2,568
1962–63	2,278
Total	11,346

Average net interest cost of Moody-rated bonds sold on the primary market for public schools: Annual, 1959–60 to 1962–63, by rating only; quarterly, 1962–63, by rating and by term of bond

Year or quarter	Aaa	Aa	A	Baa	Ba	All rated bonds
1959–60	3.26	3.63	3.77	4.21	4.55	3.84
1960–61	2.82	3.34	3.43	3.75	3.97	3.48
1961–62	2.84	3.23	3.19	3.52	3.93	3.27
1962–63	2.64	2.86	2.99	3.29	3.72	3.03
July–Sept. 1962:						
Under 15 years	2.83	2.33	2.72	3.06	.....	2.71
15–24 years	.....	2.88	3.11	3.49	3.83	3.13
25 years and over	.....	3.24	3.19	3.54	3.97	3.31
All terms	2.83	3.00	3.10	3.50	3.88	3.17
Oct.–Dec. 1962:						
Under 15 years	2.29	2.49	2.47	2.73	.....	2.50
15–24 years	2.51	2.76	2.95	3.20	3.52	2.98
25 years and over	.....	2.86	3.06	3.29	3.71	3.17
All terms	2.44	2.73	2.95	3.21	3.70	3.00
Jan.–Mar. 1963:						
Under 15 years	2.25	2.38	2.58	2.78	3.10	2.54
15–24 years	2.64	2.82	2.99	3.21	3.53	2.96
25 years and over	.....	2.93	3.02	3.33	3.82	3.15
All terms	2.62	2.78	2.98	3.25	3.69	3.01
Apr.–June 1963:						
Under 15 years	2.50	2.44	2.66	3.03	3.39	2.64
15–24 years	2.79	2.86	2.97	3.20	3.49	2.98
25 years and over	.....	2.96	3.00	3.41	3.72	3.12
All terms	2.73	2.88	2.95	3.29	3.55	3.00

Source: Sales reported by The Daily Bond Buyer; ratings, by Moody's Investors Service (rated bonds include 75–80 percent of all bonds for public school purposes).

Placed side by side, the totals in the two preceding tabulations show that the amount of approvals in school bond elections was only 66 percent of sales. Although many bonds are not sold in the year in which they are approved by voters, the 5-year totals indicate that about 34 percent of school bond sales do not require approval in elections. For the 6 calendar years 1957 to 1962, the amount of bonds approved in elections was only 60.6 percent of the amount sold during the period (*School Life*, February 1963).

THE AVERAGE NET INTEREST COST on school bonds during the July–September quarter of the 1962–63 school year was 10 basis points below the 1961–62 average (see table). In the second quarter the average dropped an additional 17 basis points and remained at that level through the month of May 1963. In June rates turned upward and reversed an 18-month trend.

An examination of the averages shows that the declines in interest rates were consistently greater as the quality rating of the bonds went down and as the term of the bond increased. This fact shows up clearly in the following comparison of the average interest rates of all sales in the first and fourth quarters of 1962–63—by rating and by term of the bonds:

	First quarter	*Fourth quarter*	*Decline*
By rating:			
Aaa	2.83	2.73	0.10
Aa	3.00	2.85	.15
A	3.10	2.92	.18
Baa	3.50	3.28	.22
Ba	3.88	3.51	.37
All rated bonds	3.17	2.96	.21
By term:			
Under 15 years	2.71	2.62	.09
15–24 years	3.13	2.94	.19
25 years and over	3.31	3.07	.24

Apparently there was a greater demand for bonds with higher yields, resulting in a narrowing of the gap of interest rates between bonds of different quality ratings and between bonds of different maturities.

Colleges and universities

By W. ROBERT BOKELMAN, *Chief, Business Administration Section, Division of Higher Education, Office of Education, and* ELMER C. DEERING

INSTITUTIONS OF HIGHER EDUCATION received $84.9 million in proceeds from bond sales during the month of June.

Of all the periods for which *School Life* has reported bond sales for institutions of higher education, June 1963 is the first to see public institutions paying a higher average interest rate than private institutions: the average net interest cost on all bonds sold in that month for public institutions was 3.49 percent—13 percentage points above the average for private institutions. On all sales in 1962 the averages for public and private institutions were, respectively, 3.33 percent and 3.44 percent; and on all sales in the first quarter of 1963 they were 3.14 percent and 3.46 percent.

The sales in June, institution by institution, are listed in the following table.

Bond sales for publicly controlled and privately controlled institutions of higher education in the United States, by institution, June 1963

Institution	Amount sold (000)	Term (years)	Average net interest cost (%)	Use of funds [1]
PUBLIC				
Arkansas State Teachers Coll.	$250	1–39	[2] 3.38	Din.
Univ. of Delaware	805	1–19	3.20	Res-din.
	1,675	20–39	[2] 3.38	Res-din.
Univ. of Illinois	6,000	1–30	3.50	Ctr.
	900	1–30	3.50	Pkg.
	2,780	1–25	3.49	Ctr.
	1,220	26–30	[2] 3.50	Ctr.
Ball State Teachers Coll.	2,450	1–33	3.62	Res-din.
	1,485	1–19	3.63	Res-din.
	1,790	20–33	[2] 3.38	Res-din.

See footnotes at end of table.

Bond sales for publicly controlled and privately controlled institutions of higher education in the United States, by institution, June 1963—Continued

Institution	Amount sold (000)	Term (years)	Average net interest cost (%)	Use of funds [1]
PUBLIC—Continued				
Indiana Univ.	4,100	1–28	3.48	Res.
	2,725	29–38	[2] 3.50	Res.
Eastern Kentucky State Coll.	3,000	1–35	3.68	Instr.
Univ. of Kentucky	7,500	1–25	3.54	Instr.
Louisiana State Univ. and A & M Coll.	350	1–9	3.12	Res.
	280	10–14	3.49	Res.
	2,990	15–39	[2] 3.50	Res.
Michigan State Univ.	4,550	1–20	3.34	Res.
Bemidji State Coll.	500	1–40	3.84	Res.
Mankato State Coll.	1,000	1–40	3.84	Res.
Moorhead State Coll.	500	1–40	3.84	Res.
St. Cloud State Coll.	500	1–40	3.84	Res.
Winona State Coll.	500	1–40	3.84	Res.
Mississippi State Univ.	730	1–38	3.48	Res.
	1,558	1–38	[2] 3.50	Res.
East Tennessee State Coll.	186	1–15	3.45	Res.
	344	16–30	[2] 3.50	Res.
A & M Coll. of Texas	1,005	1–15	3.49	Res.
	3,738	16–40	[2] 3.50	Res.
	2,500	1–20	3.31	Pow.
Washington State Univ.	4,580	1–30	3.48	Instr.
Univ. of Wisconsin	1,450	1–20	3.05	Multi.
PRIVATE				
San Francisco Coll. for Women.	1,900	1–38	[2] 2.88	Res.
Chaminade Coll. of Honolulu.	203	1–39	[2] 3.50	Res.
Bradley Univ.	300	1–28	[2] 3.38	Ctr.
	1,265	1–39	[2] 3.38	Res.
Quincy Coll. and Sem.	775	1–39	[2] 3.38	Res.
Butler Univ.	785	1–34	[2] 3.50	Res.
Baker Univ.	147	1–29	[2] 3.38	Ctr.
Coll. of Notre Dame of Maryland.	500	1–39	[2] 3.38	Res.
Emerson Coll.	202	1–29	[2] 3.38	Res.
Hope Coll.	1,500	1–39	[2] 3.38	Res-din.
Ithaca Coll.	3,000	1–39	[2] 3.38	Res.
Marist Coll. (N.Y.)	1,300	1–39	[2] 3.38	Res.
Belmont Abbey Coll.	600	1–44	[2] 3.38	Res.
Findlay Coll.	150	1–39	[2] 3.38	Ctr.
Kenyon Coll.	625	1–40	[2] 3.50	Res.-din
Wittenberg Coll.	1,550	1–38	[2] 3.50	Ctr.-res.
Lewis and Clark Coll.	1,798	1–38	[2] 3.50	Res-din.
Pacific Univ.	484	1–38	[2] 3.50	Res-din.
Susquehanna Univ.	740	1–49	[2] 3.38	Res.
Lane Coll.	290	1–39	[2] 3.50	Res.
Hampton Inst.	1,600	1–49	[2] 3.38	Res.
Bethany Coll. (W. Va.)	695	1–49	[2] 3.38	Res.
Lawrence Coll. (Wis.)	670	1–39	[2] 3.38	Res.

[1] Abbreviations in this column indicate the following uses: Din., dining; Instr, instructional; Multi, multipurpose; Pkg, parking; Pow, powerplant; Res, residential; Ctr, student center.

[2] Purchased by Community Facilities Administration, Housing and Home Finance Agency.

Bonds sold for higher education, June 1963: Number and amount of sales and average net interest cost, by type of institutional control, type of financing, type of bond, and type of facility to be constructed

Type of financing, bond, and facility	Number of sales	Bonds sold		Average net interest cost (%)
		Amount (000)	Percent of total	
	Public institutions			
Type of financing:				
HHFA	9	$16,290	25.5	3.47
Other	23	47,551	74.5	3.50
Type of bond:				
Revenue	30	62,391	97.7	3.50
General obligation	1	1,450	2.3	3.05
Type of facility:				
Academic	4	16,530	25.9	3.51
Instructional	3	15,080	23.6	3.55
Multipurpose	1	1,450	2.3	3.05
Auxiliary	26	44,011	68.9	3.50
Residential	17	25,556	40.0	3.50
Residential-dining	5	8,205	12.8	3.48
Dining	1	250	.4	3.38
Student center	3	10,000	15.7	3.50
Campus improvements	2	3,300	5.2	3.36
Total, public institutions	32	63,841	100.0	3.49
	Private institutions			
Type of financing: HHFA	23	21,079	100.0	3.36
Type of bond: Revenue	23	21,079	100.0	3.36
Type of facility: Auxiliary	23	21,079	100.0	3.36
Residential	15	14,525	68.9	3.32
Residential-dining	4	4,407	20.9	3.46
Student center	3	597	2.8	3.38
Student center-residential	1	1,550	7.4	3.50
Total, private institutions	23	21,079	100.0	3.36
	All institutions			
Type of financing:				
HHFA	32	$37,369	44.0	3.41
Other	23	47,551	56.0	3.50
Type of bond:				
Revenue	54	83,470	98.3	3.47
General obligation	1	1,450	1.7	3.05
Type of facility:				
Academic	4	16,530	19.5	3.51
Instructional	3	15,080	17.8	3.55
Multipurpose	1	1,450	1.7	3.05
Auxiliary	49	65,090	76.6	3.45
Residential	32	40,081	47.2	3.44
Residential-dining	9	12,612	14.8	3.47
Dining	1	250	.3	3.38
Student center	6	10,957	12.5	3.49
Student center-residential	1	1,550	1.8	3.50
Campus improvements	2	3,300	3.9	3.36
Total, all institutions	55	84,920	100.0	3.46

GERALD R. SMITH

Project social studies—a report

Project Social Studies, which the Office of Education began last year with funds from its Cooperative Research Program under Public Law 83–531, has made more progress than we expected when we made our first announcement about it in this magazine, in November. At that time we were inviting colleges, universities, and State departments of education to submit proposals for *two* curriculum study centers and announcing that we had funds also for a number of projects of basic and applied research and for activities designed to stimulate research. Now, little more than 6 months later, we can announce that awards have been approved for 7 curriculum centers, 11 research projects, and 2 developmental activities. In other words, we can say that, of the six types of programs now available under the Cooperative Research Program, Project Social Studies is already utilizing three. Of the other possibilities, more will be said later.

Curriculum study centers*

Contracts have been signed with seven institutions of higher education to establish curriculum centers to fulfill one or more of these purposes: (1) To redefine the aims of social studies curriculums at one or more grade levels; (2) to develop sequences of presenting subject matter that are based on what is known about human development and the teaching-learning processes; (3) to work out methods and prepare materials to meet specific needs; (4) to try out new methods and materials and evaluate them; and (5) to disseminate information about the most promising methods and materials. The following list identifies each center and briefly summarizes what it will do (requests for information on the work of the centers should be directed to the centers—not to the Office of Education).

Carnegie Institute of Technology. Under the direction of Edwin Fenton, a center will prepare materials and make suggestions on reading materials for able students of history and social sciences in grades 9 to 12. (Term of contract with the Office of Education: April 1963 to October 1967.)

University of Minnesota. Under the direction of Edith West and others, a center will use an interdisciplinary team of experts to identify the structure of each of the social science disciplines. It will prepare and evaluate guides and materials to be used from kindergarten through grade 14. (Term of contract: April 1963 to June 1967.)

Harvard University. Under the direction of Donald W. Oliver, a center will plan a social science curriculum based on an analysis of public issues. For a curriculum including approximately 30 teaching units organized around 5 persistent social problems, it will select, develop, and evaluate instructional materials and teaching procedures for grades 8, 9, and 10. (Term of contract: July 1963 to June 1968.)

Syracuse University. Under the direction of Roy A. Price, a center will identify the basic concepts which should be communicated to students in the social studies program and prepare illustrative materials for three grade levels. (Term of contract: May 1963 to June 1968.)

Ohio State University. Under the direction of Edward J. Furst, a center will concentrate on economics at the 9th-grade level. It will analyze the structure of economics as a discipline, prepare materials, and disseminate information about those materials that prove most effective at this level. These materials will serve as models for others that will be developed at the secondary school level. (Term of contract: October 1963 to September 1966.)

Northwestern University. Under the direction of Jonathon McLendon, a center will work at improving instruction about U.S. society in grades 5, 8, and 11. It will attempt to eliminate the unnecessary duplication that occurs in the teaching of American history at these grades and will develop and evaluate instructional materials to re-

*Until just recently, curriculum study centers and other curriculum improvement projects under Cooperative Research Program were restricted to English and the social studies. Beginning with this new fiscal year, the Program will entertain proposals on any subject in the curriculum at any educational level.

Mr. Smith is research coordinator, Division of Educational Research, Office of Education. He is also chairman of the professional committee within the Office on the program of Project Social Studies. The committee is Officewide: it includes Wilhelmina Hill, vice chairman, and Howard H. Cummings, both from the Division of Elementary and Secondary Education; John L. Chase, from the Division of Higher Education; and William C. Gescheider and Richard H. Hedrich, both from the Office of the Associate Commissioner, Bureau of Educational Research and Development.

place those that are eliminated. (Term of contract: September 1963 to June 1968.)

University of Illinois. Under the direction of Ella C. Leppert, a center will work out three sequential courses for a social studies program for the secondary school. These courses are to be part of a 5-year sequence designed to help students understand the basic structure of the social order, the dynamic nature of societies, and the effects of social change. (Term of contract: August 1963 to December 1968.)

Research projects

When the Research Advisory Council for the Cooperative Research Program met in April, it approved 11 of the projects that had been proposed for basic or applied research in the social studies. Some of these are concerned with social studies in the schools—that is, with the content of the curriculum, the methods of teaching, the materials used—whereas others are concerned with the relationship between social problems and education. At this writing, seven of the approved projects have been signed into contract; they are listed below, together with the name of the director, the sponsoring institution, and the Cooperative Research Program's identifying number:

2065. A study of education and the social structure. John K. Folger, Florida State University.

2071. Social and cultural factors in school achievement. Bernard Goldstein, Rutgers University.

2072. An experiment in comprehensive informal education: The Gadna Program. Joseph W. Eaton, University of Pittsburgh.

2101. The usefulness of graphs with text in promoting learning in the social studies. O. L. Davis, Jr., Kent State University.

2213. The nature and use of printed conservation-education materials from government agencies, private organizations, and other sponsors. Carl S. Johnson and Charles A. Dambach, The Ohio State University.

2258. Family factors and the dropout, 1920–60. Beverly Duncan, University of Michigan.

2321. The educational and sociological impact on the residents of a county that has had no public schools for 4 years. Robert L. Green, Michigan State University.

In addition to approving these projects, the Research Advisory Council at its April meeting recommended that a number of proposals be revised and resubmitted. Most of these will probably be resubmitted on September 1, the next deadline for basic and applied research proposals. Applications postmarked on or before that date will be considered by the Research Advisory Council at its November meeting.

Developmental activities

The Cooperative Research Branch uses the word "developmental" to apply to a wide variety of activities designed to stimulate new research, to expose problems that need to be explored and attacked on a large scale, and to increase the competence of educational researchers. Among these activities, for example, are conferences, the development of theories and experimental or evaluative devices, and analytical and integrative reviews of research literature. Proposals for such activities are accepted by the Cooperative Research Program only if they have been invited by a staff member, but the Program always welcomes suggestions and ideas.

Two conferences have been contracted for under Project Social Studies.

The first conference will be held July 15–19 at Stanford University, under the direction of G. Wesley Sowards, associate professor in the school of education. It will be, in effect, two conferences in one: A small working seminar, which will meet for the whole week, and a large working conference, which will meet for 3 days in the middle of the same week.

The seminar will be made up of 10 social scientists and 10 social studies educators, who will meet to consider such matters as the extent of agreement on the place of the social studies in the curriculum, the improvements most needed, and the research most needed to bring those improvements about. They will meet for 2 days separately, will join the large conference on the evening of the second day, and, when the larger conference is over, will continue their work together for another day. They will also meet separately during free times in the middle of the week.

As many as 175 persons will be invited to the large conference: Two representatives from each State department of education, one of whom will be the person responsible for the social studies in the department; and 75 social scientists and members of the instructional staffs in local school districts who have shown leadership in the social studies.

At each general session the conferees will hear papers prepared to stimulate thought and discussion. At this writing, plans include papers by Peter Odegard, Paul R. Hanna, I. James Quillen, Arno Bellack, and Ralph Tyler. After each general session the conferees will go into small groups for discussion; each group will include, as observers, two members of the seminar—one social scientist and one social studies educator.

By the time the conference adjourns, the planners hope, it will have accomplished certain things:

Developed a statement on the functions of the social studies in the school curriculum—a statement that will take note of any sharp differences of opinion.

Explored the reasons for public reluctance to permit the social studies program to be realistic.

Considered the need for more and different instructional materials.

Thrown light on the problems of preparing teachers to work with an improved social studies curriculum.

Made an effort to outline, at least in broad strokes, the research that is needed; explored the feasibility of carrying out the various studies; made suggestions as to what should have priority; and considered the strategy for getting the research under way and the question of who should participate in it.

The second conference will be held early this fall at Syracuse University, under the sponsorship of the Maxwell Graduate School of Citizenship and Public Affairs with cooperation from the School of Education. The chairman will be Stephen K. Bailey, dean of the Maxwell School; the conference coordinator is Roy A. Price, professor of social science and education.

Planners of the conference have taken note of the many efforts being made across the Nation to revise the teaching of the social sciences in the elementary and secondary schools—the committees, commissions, and projects established by the various scholarly associations; projects set up in a number of cities under either private or foundation support; and the many instances of curriculum revision in the schools—and, though they acknowledge that many of these efforts are well conceived and certainly will contribute a great deal, they are disturbed by the fact that much is being done without a sufficient base in research findings. What is more, they point out, there is a lag between what is already known from research and what is taught. The conference is being planned, therefore, to pull together the findings of research already completed, to identify problems on which research is needed, and to stimulate research on those problems.

About 40 persons will be invited to attend. Among them will be persons exceptionally qualified to advise on hypothetical approaches to research design; scholars in the social sciences and the behavioral sciences; psychologists; educators of teachers; practitioners selected from among classroom teachers, supervisors, and administrators; and representatives of State departments of education and of such organizations as the National Council for the Social Studies. Also in attendance will be a number of distinguished scholars and educators, who will participate as speakers and consultants.

So far, Project Social Studies has tapped the resources of only three programs under the Cooperative Research Program. In fiscal year 1964, two new programs—small contracts and research and development centers—and an expanded demonstration program will be available as sources of funds.

The small contract program will support small-scale research—projects requiring less than $7,500 in Federal support. This program has been designed to encourage doctoral students to do more significant research than they could have done without assistance and to enable experienced researchers to probe a problem, to look into the potential value or the feasibility of an extensive research project, without presenting a fully developed research design.

Proposals under this program have the advantage of a special review process which takes less time than the regular procedure. There are no deadline dates; review begins on receipt of the proposal, and funds can be made available for an approved project about 2 months after the proposal is received in the Office. Any student wishing to submit a proposal under this program must be sponsored by a professional employee of a college, university, or State department of education who will assume responsibility for seeing that the research is completed according to the terms of the contract.

Research and development centers will be established during this fiscal year to concentrate human and financial resources on a particular problem area in education over an extended period of time in an attempt to make a significant contribution toward an understanding of, and an improvement of educational practice in, this problem area. The activities at each center will include basic and applied research studies; developmental activities designed to translate research findings into educational materials and procedures; and demonstrations of, and dissemination of information on, the newly developed and tested materials and procedures. In addition the professional staff of the center will provide leadership to the profession in the chosen problem area.

The focus of the centers may be on any major problem of significance to education. Also, there is no specific limit placed on the duration of the centers or on the amount of Federal funds that may be allocated to them.

This year the demonstration program will be expanded. The major purpose of a project in this area will be to disseminate information on new educational materials or techniques which have already been proved successful.

These then, are the various programs under which social studies projects may be supported. Application information for all of these programs may be obtained by writing to the Cooperative Research Branch, U.S. Office of Education, Washington, D.C., 20202.

AD Minutes Briefly noted--- for the busy School Administrator

Material for this department is prepared by the staff of the School Administration Branch, Division of State and Local School Systems.

School officials in New York City will seek assistance from the grassroots in the preparation of operation and construction budgets. In the future, the 25 local school boards will take an active part in preparing budget requests. The boards, after holding public hearings in their own localities, will join their assistant superintendents in presenting district budget needs to the superintendent and the board of education.

The Atlanta public school system has intensified its efforts to reduce interruption of classroom instruction by maintenance activities. Each school will now be served by a groundskeeper and a building mechanic during the day, and cleaners in the afternoon and evening. As a general rule, they will work before and after school hours, during lunch, weekends, holidays, and the summer when the school is not in session, through a system which rotates and staggers work hours.

The 1963 Washington State Legislature has again appropriated $150,000 for the educational research program sponsored by the State office of public instruction. The new appropriation makes it possible for the State office to continue its research studies on dropouts, the education of gifted students, guidance, new teaching media, and other subjects.

The General Commission of the Indiana State Board of Education has put teeth into the charge from the legislature to maintain educational standards. In April the commission eliminated 2 small county high schools which had fewer than 100 students, and it has served notice that henceforth application of sound educational standards with respect to small high schools will be vigorously enforced. Under the new policy the commission will take a hard look at all high schools in the State with 100 or fewer students with a view to eliminating inadequate ones through withholding accreditation and State funds.

State department of education files show that there are 114 high schools in Indiana with fewer than 100 pupils; 11 have fewer than 50 students.

About 2,500 persons have been employed by individual schools under the new school aide program introduced by the board of education in New York City to relieve members of the instructional staff of nonteaching chores. The aides serve in all elementary schools, academic high schools, and vocational high schools; also in a pilot project in 20 junior high schools. The principal of each school hires them for 2 to 5 hours daily on schooldays, subject to civil service regulations. An additional force of 2,900 have been serving the schools as lunch program assistants.

The city of Philadelphia has established a key staff position on the development and coordination of the long-range plans of both the school system and the city planning commission. The Pittsburgh school system already has such a position. A staff member of the city planning commission cooperates very closely with employees of the Pittsburgh Board of Education in planning ways to meet long-range needs, particularly the complementary plans and programs of city schools and urban renewal.

In March, voters in Seattle turned down a 9.8 school mill levy. Faced with a revenue loss of nearly $7.5 million from the projected 1963–64 school budget, the Seattle Board of Directors voted unanimously to resubmit the measure to the voters. When they did so 2 months later, the measure passed by 61.4 percent majority. At least 60 percent of the votes cast in the election had to be favorable in order for the levy to pass.

A recognizable picture of a teacher will be presented on television beginning next September in *Mr. Novak*, the story of an English teacher and a principal grappling with educational and personal problems in a modern high school.

The producer of the series has directed the writers of the show to spend hours in their neighborhood high schools. He personally made a special tour of high schools in Denver, St. Louis, Kansas City, and Chicago. To further insure authenticity, panels of teachers and administrators check scripts before each program is filmed and educators serve as technical advisers.

Educational television is booming in institutions of higher learning, according to a survey by J. G. Paltridge, statewide coordinator of educational television for the University of California. Sixteen of the Nation's 17 largest universities (20,000 or more students) and 3 out of 5 institutions with enrollments of 10,000 to 20,000 have some form of instruction for credit by television. Mr. Paltridge also found that 20 of the 22 institutions with the highest academic rating used some form of educational television.

VERYL SCHULT AND THEODORE L. ABELL

Inservice education of mathematics teachers

This article reports highlights from a conference on which a full report will be published later, as a separate document.

MATHEMATICS teachers in the elementary and secondary schools are participating in the largest back-to-school movement in mathematics this country has ever seen.

The National Science Foundation (NSF) already has spent $90 million of Federal tax money on mathematics institutes for secondary school teachers and will spend $30 million more between now and 1965.

All over the country, State and local educational agencies are sponsoring workshops and inservice programs: in Illinois more than 8,000 elementary school teachers have attended State-sponsored workshops; in Rhode Island last year 87 percent of the junior and senior high school mathmetics teachers were in inservice courses; and last summer Georgia paid about $375,000 in grants-in-aid to teachers for summer study at colleges and universities—many of them in mathematics.

If the total picture were as bright as these figures suggest, the Office of Education would have had no reason to call its conference on inservice education for mathematics teachers last March. But the total picture is not bright. The fact is that the demand—the *need*—for inservice education far exceeds the supply. Every mathematics teacher in the country today faces a responsibility to prepare himself for substantial changes in his subject: the new curriculums are requiring him to emphasize the unifying principles and structure of mathematics, the study of number systems and of numeration systems to bases other than 10, logic and deductive thinking, the language of sets and elementary set theory, and a more precise mathematical vocabulary. How swiftly the changes are coming can be illustrated by the experience of one State: In 1960 it could count only two experimental mathematics programs in all its public schools; in 1963 it had only two school systems *without* an experimental program. And each new program requires teachers who have done some recent studying.

The number of mathematics teachers preparing themselves for change is impressive, but it does not seem so large when it is compared with the number who are not.

There are about 1 million teachers in the elementary schools from kindergarten through grade 6, and most spend from 15 to 20 percent of their days teaching mathematics. But not even one in a thousand has participated in a National Science Foundation institute in mathematics. Of the 100,000 secondary school teachers of mathematics, only about 30,000 have done so. If all teachers of mathematics were to enroll in organized inservice courses in mathematics, there would not be enough qualified instructors to teach them.

The problem is complicated by the fact that many teachers of mathematics do not even have a background of college training in the subject. As many as 29 States require no undergraduate courses in mathematics for the certification of elementary school teachers. A recent study of the curriculums of a random sample of 213 colleges and universities that prepare teachers showed that—

11 percent require no mathematics in preparing teachers for the elementary school,

30 percent require only 1 course, and

21 percent of the mathematics departments offer no courses for the prospective elementary school teacher.

This, in face of the fact that the Committee on the Undergraduate Program in Mathematics of the Mathematical Association of America (CUPM) recommends that the college training of elementary school teachers include 2 full years of mathematics—a two-course sequence on the structure of the real number system and subsystems and a course each in the basic concepts of algebra and in informal geometry!

Even those teachers who do have a college background often find themselves inadequately prepared. Many college mathematics courses have remained largely traditional

Miss Schult and Mr. Abell are, respectively, specialist and research assistant in mathematics, Office of Education. Miss Schult came to the Office in 1962 from the Washington, D.C., public schools, where she had been supervising director of mathematics since 1938. Mr. Abell came early this year; he had been a teacher of mathematics and a high school principal in Illinois.

and in doing so have failed to prepare teachers to teach mathematics in schools whose curriculums have incorporated a more modern type of mathematics.

Obviously some form of inservice education is needed in every school that aims at keeping its mathematics program up to date. But good programs of inservice education are not easy to come by. They cost money, they call for plans and decisions, and they require expert teachers.

Against this complex of circumstances and problems, the Office of Education called a conference on inservice programs for mathematics teachers on March 7 and 8, 1963. Its purpose was to study programs and practices in a number of States, to find out how these programs were being supported, and to develop plans for pilot inservice programs in States that want special assistance.

Participants in the conference were State supervisors of mathematics, the president and members of the committee on inservice education of the National Council of Teachers of Mathematics, and consultants from the American Association for the Advancement of Science, the Conference Board of the Mathematical Sciences, the Mathematical Association of America, the National Science Foundation, and the National Aeronautics and Space Administration.

Practical answers to practical questions was one of the goals of the conference, and the information and ideas brought out in the reports and discussions can well be summarized in that form.

Who starts inservice programs?

Mathematics staffs of institutions of higher education. A few years ago when experimentation with new curricular materials began on a wide scale, colleges and universities took the responsibility for providing inservice education for teachers. In many projects, such as those of the University of Maryland and of the University of Illinois Committee on School Mathematics, the university staffs prepared teachers to use the experimental materials in classes and workshops. State and local school systems have continued to draw heavily on colleges for help in planning procedures, organizing activities, getting the inservice programs under way, and teaching the classes.

State departments of education. State supervisors of mathematics have taken the leadership in many States in getting programs started. In 1-day meetings of administrators, supervisors, and mathematics teachers, they have drawn attention to the great expansion of mathematical knowledge, its applications in technology, and the implications for the classroom. These meetings have usually been followed by longer institutes and workshops. Maine, for instance, has held a number of 1- or 2-day workshops on the new movements in mathematics and emphasized the implications for elementary school teachers.

In the first phase of its "Project Idaho," Idaho recently covered the State with five 1-day regional meetings of administrators, consultants from universities and colleges, the State supervisor of mathematics, a specialist in mathematics from the U.S. Office of Education, and a representative school superintendent. These conferences emphasized the need for inservice education for mathematics teachers, explained the project and enlisted support of administrators, and solicited nominations of well-prepared teachers to participate in a 2-week leadership workshop. This workshop will help prepare 24 teachers to serve as consultants to local programs.

Committees for curriculum study and production. A committee studying mathematics curriculums of a particular school system with a view to updating them can provide a sound beginning for an extended inservice program by pointing out areas that need strengthening. Its suggestions may lead to inservice workshops, institutes, or formal courses of instruction.

The Illinois inservice workshops for elementary school mathematics teachers were first suggested in a report, *The Teaching of Mathematics in Illinois,* published in April 1958, after 3 years of intensive study by the Mathematics Study Group of the Planning Committee for the Allerton House Conference on Education in Illinois.

In the fall of 1962 Georgia made a new mathematics guide available to teachers. Since then teachers, recognizing their lack of knowledge of many topics covered in the guide, have made widespread demands for inservice work.

Most States are working on some level of mathematics curriculum. In North Carolina, for example, a 21-member committee is preparing a curriculum guide for junior and senior high schools.

Textbooks committees. Local administrators and supervisors have found a textbook committee useful in initiating inservice education. Discussion of the criteria for selection of text materials, new information provided by consultants, and review of the new texts all help to acquaint teachers with the new mathematics and to develop leadership in the inservice work that follows the introduction of a new textbook series.

Professional organizations and their affiliated groups. The National Council of Teachers of Mathematics (NCTM) has helped keep the States informed of developments through its journals—*The Mathematics Teacher* and *The Arithmetic Teacher*—its yearbook, and smaller publications prepared to meet specific needs. One outstanding service was its work with school administrators in eight regional conferences held in various sections of the country. The conference report, summarized in the *Revolution in School Mathematics—a Challenge for Ad-*

ministrators and Teachers, points up the need for inservice education.

Affiliates of NCTM have started inservice programs. The Ohio Council of Teachers of Mathematics, for example, furnishes consultants for local inservice institutes in the State. The District of Columbia Council of Teachers of Mathematics and many other such NCTM affiliates have held 1-day institutes with emphasis on the elementary school program. These have led to a greater interest in NCTM and to further inservice work.

Cooperating organizations. Several organizations working together have stimulated professional growth, acquainted teachers with developments in their fields, and encouraged wider participation in inservice programs. The weekend conference at Gearhart, Oreg., in October 1962, was a joint effort of the State departments of education of Oregon and Washington and all NCTM affiliates in the two States. The Associated Teachers of Mathematics in Connecticut (ATOMIC) is cooperating with the State department of education in sponsoring a 1-week summer institute for their elementary school teachers; principals and supervisors participate in some of the sessions. The Illinois Council of Teachers of Mathematics cooperated with the mathematics consultants of the office of the State superintendent of public instruction in staffing their first series of workshops. The officers of the Georgia Mathematics Council have cooperated with the State mathematics consultant in improving mathematics education and have devoted some council programs to the State's new curriculum guide. Louisiana's 3-day midwinter conference of parish, city, and State supervisors was devoted entirely to the new mathematics.

How can instructors of quality be provided in quantity?

The demand for instructors of inservice classes has become so great that college staffs are now faced with more requests for conducting inservice classes in mathematics than their time will permit. Schools have therefore had to look to other sources for instructors.

Outstanding elementary school teachers. Both New York State and Washington, D.C., have successfully used outstanding elementary school teachers to teach inservice courses.

Teachers who have attended NSF institutes. The reservoir of teachers of mathematics, about 30,000, who have attended one or more NSF institutes is now a potential source of supply for instructors. However, conferees generally agreed that, in addition to a knowledge of mathematics, instructors of inservice courses for elementary teachers should have pleasing personalities, teaching experience on or near the same level as members of the class have, and ability to communicate effectively and should be recognized as leaders by their colleagues. They also agreed that instructors of mathematics teachers in elementary schools would be more effective if they attended one or more preparatory sessions before they taught and after they had taught several classes, several sessions to discuss their experiences and problems.

In its NSF programs Washington State University at Pullman has conducted seminars in "The Foundations of Arithmetic" for elementary school teachers. These seminars were made available to a selected group of NSF participants who could qualify on the basis of mathematical competency, desire to conduct a course for their colleagues, and a statement from their local superintendents or school boards that they and their colleagues would be given time, opportunity, and financial support for such inservice work during the academic year.

Other qualified persons. The Georgia State Department of Education and the University of Georgia are cooperating in a 6-week workshop to prepare well-qualified mathematics teachers to teach graduate credit courses at various centers over the State and under the direction of a university mathematics staff member.

Project Idaho is designed to develop a core of qualified instructors of inservice classes. It has some financial support from the National Council of Teachers of Mathematics and extra consultant service from the mathematics specialists of the U.S. Office of Education.

What uses of the new media are being made in inservice education?

Television. There are many projects in educational television under way throughout the country, some designed primarily for the education of teachers, others primarily for the education of students.

North Carolina has a weekly series, "Methods for Modern Teachers," that is televised in many parts of the State. Three or four of the programs during the year deal with mathematics. The University of North Carolina is rerunning the Continental Classroom series.

Utah's television inservice program in mathematics during 1963–64 is being planned and prepared by the State Secondary Mathematics Curriculum Committee.

Vermont's WCAX–TV presented a 4-week series of daily telecasts on the language of mathematics for orientation of teachers.

The Greater Washington (D.C.) Educational Television Station, WETA, presented a program on "Contemporary Mathematics" for elementary school teachers in the school year 1962–63. Each 1 hour program was telecast on Mondays and Wednesdays at 3:30 p.m. and on Thursdays at 7:30 p.m. Some nearby districts required teachers to

view the program; others encouraged them to. The University of Virginia Extension Division granted college credit for the course.

Washington State's Clover Park television station has presented a series of 16 half-hour tapes in weekly showings for elementary school teachers.

Kinescopes and tapes. New York State has used kinescopes and tapes extensively for several years. The State department of education made kinescope recordings of a full year's televised course of 89 half-hour lectures in "Modern Mathematics" and telecast them from various centers. These 16-mm sound films have since been shown at various centers about the State, where mathematics teachers view and discuss them. A complete set of lecture notes is furnished free to teachers. Several sets of the films have been furnished at cost to other State education departments.

New York also has furnished a television inservice course of 30 lessons for junior high school mathematics teachers and one of 36 lessons for elementary school teachers. Tapes of both are available from the State department without cost to television stations.

Films. Pennsylvania has used films extensively for inservice education, including "Teacher Education in Modern Mathematics," a series of five films on new content recommended by the Commission on Mathematics; "Understanding Numbers," seven half-hour films for elementary school teachers, but also useful to junior high school teachers; "Elementary Mathematics Films Series" and "Junior High School Mathematics Films Series," two series of half-hour films on the Greater Cleveland Mathematics Program.

"Films for Mathematics Teachers"—about 210 half-hour films financed by NSF and produced by the Minnesota National Laboratory—presents a series of demonstration lessons using the SMSG materials for each of grades 7–12. There is also a set of 14 to 20 lectures for teachers at each grade level on the mathematics background of the new courses.

"Films in Mathematics for Elementary School Teachers," a project also financed by NSF, is designed to produce 12 half-hour kinescopes for an inservice program. The films will very likely be made available through a cost rental-purchase plan. Further information may be obtained from the Director of Field Services, State College of Iowa, Cedar Falls, Iowa.

Transparencies for overhead projectors. With the greatly increased use of overhead projectors, transparencies for them have become very useful, especially with large classes.

The Texas Education Agency, by an arrangement with SMSG, has developed an almost complete series of transparencies for the 7th-, 8th-, and 9th-grade SMSG courses being taught in their inservice program. Aside from being instructional aids, these visuals make it possible for the instructor to compress much more material into the class time.

Programed materials. Programed materials are also proving useful. The State Education Department of North Carolina in cooperation with Duke University has planned institutes for elementary school supervisors in which programed materials will be used. Pennsylvania has made programed materials available to teachers.

How can programs be financed?

Regular appropriations by State legislature. The usual source of funds for State-directed inservice education is a regular appropriation by the State legislature. The amount appropriated largely determines the number of consultants who can be provided, the amount of matching NDEA funds, and the elements of inservice education.

Special appropriations by State legislature. North Carolina has appropriated $300,000 for the 1961–63 biennium for an inservice program under the State department of education.

Georgia, through its grant-in-aid program gives many teachers an opportunity to attend summer school. To be eligible for a grant, a teacher must hold a bachelor's degree, have 2 years of satisfactory teaching experience, make a specified qualifying score on the National Teachers Examination, and, in the year after he attends summer school, be employed full time in teaching, with the major part of his time spent in his field of study.

Virginia has appropriated $200,000 for the year 1963–64 for inservice education in all areas of the school curriculum. The 1960 appropriations act designated that a part of the funds be used for summer institutes. Institutes in mathematics have been set up at State-supported colleges and are conducted similarly to those of NSF.

Federal funds. Federal support is made available from two main sources—the Office of Education and the National Science Foundation.

Budgets of local school systems. Substantial amounts have been included in some local budgets for inservice programs. It is possible that local districts will become the major source of funds.

Joint support from several agencies. Funding and accounting procedures in some States permit joint use of Federal, State, and local funds. For example, in South Carolina, where local funds may be used for matching purposes in securing funds under National Defense Education Act, Title III, inservice workshops are sponsored jointly by the State department of education and local school districts. The department finances and directs the workshops, and

the local district remits 50 percent of the total cost to the State for use in matching Federal funds.

Business and industry. In some States, local business or industry has made substantial contributions to improve the competence of teachers in their communities. For instance, business interests in Richmond, Va., recently sponsored a 2-week workshop for mathematics teachers. Some corporations have sponsored summer institutes for mathematics teachers: large corporations such as Shell Oil Co. and General Electric Co., annually; others from time to time.

The conferees recommended that supervisors investigate other possible local sources of support.

Teachers. Although inservice education has received an added impetus in recent years by greatly increased financial help, most teachers still use their own funds for professional improvement.

What can professional organizations and Federal agencies contribute?

National Council of Teachers of Mathematics (NCTM). Most of the services of NCTM are for the general professional improvement of teachers. These services include the monthly magazines, yearbooks, supplementary publications for specific needs, and regional and national meetings, special conferences, and projects. Copies of the reports of NCTM's conferences, mentioned earlier, are sent free to NCTM members. NCTM committees or groups are working on professional standards, relations with industry, and special projects on such problems as mathematics for the slow learner and films for elementary school teachers. NCTM also cooperates with other organizations in many professional activities.

Mathematics Association of America (MAA). The efforts of MAA's teacher training panel, a subcommittee of its Committee on the Undergraduate Program in Mathematics (CUPM) to improve the preservice training of mathematics teachers, will affect inservice education. Its guidelines, course outlines, and point of view are expected to be useful in both programs. MAA also contributes to inservice education in other ways. MAA lecturers who go to high schools to speak in meetings of high school students are available for meetings with teachers. MAA's *Mathematical Monthly* contains much of interest to secondary school teachers, including a special section, "Mathematical Education Notes."

The Conference Board of the Mathematical Sciences (CBMS). This board was organized because of the common interests of various associations. These groups recognized that the education of mathematics specialists, including those in research, depends upon the quality of instruction offered at each grade level of the mathematics program, and that the preparation of mathematics teachers is a matter of concern to all of them.

The CBMS Forum for Mathematical Education serves as a channel of communication on problems and suggestions for solutions of them.

National Science Foundation (NSF). NSF makes financial grants to the scientific community, primarily to colleges and universities, in support of programs designed to improve mathematics education. Among these are summer, academic year, and inservice institutes; experimental curriculum projects including those of SMSG; research programs.

The institute program is the largest program; it has reached an estimated 30,000 secondary school mathematics teachers over the past 9 years at a cost of about $90 million. NSF institutes emphasize the strengthening and updating of the teachers' fundamental knowledge of mathematics so that teachers are better prepared to make professional judgments on what should be done in the classroom. Few elementary school teachers of mathematics have participated in them.

NSF also makes grants for the production of materials. The School Mathematics Study Group (SMSG), the broadest of these programs, brings together expert mathematicians and educators to prepare text materials for elementary and secondary schools mathematics. SMSG has already published sample textbooks for grades 4 through 12 (they will be made available for classroom use by commercial publishers) and is preparing experimental materials for the earlier grades. All SMSG texts are accompanied by commentaries for teachers. SMSG also publishes "Studies in Mathematics" to help teachers with specific phases of algebra and geometry.

NSF has also made grants for the production of films for use in inservice programs and for a television course, "Patterns in Arithmetic," to test the idea of teaching arithmetic to teachers and pupils simultaneously.

National Aeronautics and Space Administration (NASA). NASA has sponsored a week's conference on "Mathematics and the Space Age" for State mathematics supervisors and spacemobile lecturers at the Marshall Space Flight Center, and has supplied mathematics teachers with publications suggesting up-to-date and exciting applications of the mathematics that they are teaching.

U.S. Office of Education (USOE). The Office contributes to inservice education through the Federal grant program it administers and through the work of its specialists in mathematics. Under Title III, NDEA (improvement of instruction in mathematics and science and foreign languages and expansion and improvement of supervisory and related services), the Office makes funds available to the States. These funds have been used for

mathematics workshops, conferences on developments in content and methods, publication and distribution of curriculum bulletins, and other purposes. Title VII of the act (research grants and dissemination programs) makes funds available for research in the uses of new educational media and for the dissemination of research findings.

The primary responsibility of Office specialists in mathematics is to assist in the national effort to improve the quality of instruction in school mathematics. To accomplish this mission, the specialists cooperate with State departments of education in their efforts to improve instruction; study programs for the educationally disadvantaged for the double purpose of assisting the schools and securing information useful to the Office; keep up with developments in curriculum improvement, inservice programs, and other innovations in elementary and secondary education in order to disseminate the information they gather; maintain close contact with college and university staffs to encourage them to improve their inservice programs for mathematics teachers and their research in mathematics education; cooperate with persons in other Federal and professional organizations in planning programs that will help to improve the quality of mathematics instruction; and prepare publications that will be useful to mathematics teachers and supervisors.

How shall parents be informed of the changing mathematics curriculum?

Schools can ease the pressures that arise from changes in the curriculum by making the changes and reasons for them known through the schools' publicity material.

All teachers in a school should be kept informed of the advances in mathematics education and of the school's plans to include them in its curriculum and should have a part in planning publicity programs. Several means may be used to reach the public: Television broadcasts, newspaper stories, films, evening classes for parents, special programs at meetings of the PTA and civic or science groups, and special bulletins.

What are some of the promising practices?

Much fine inservice work is in progress throughout the country, but lack of space prevents our making a detailed description of it in this report. The following list will suggest the scope and variety of the programs already in existence:

Encouraging the use of materials for independent study.

Offering noncredit courses to attract hesitant teachers.

Offering credit courses to strengthen the background of teachers.

Offering opportunities for informal discussion.

Preparing guides for teachers to see them through transition period.

Providing teachers with opportunities to use experimental materials in their classrooms.

Studying, discussing, and evaluating new textbooks.

Providing inservice work through correspondence courses.

Using newsletters, bibliographies.

Providing a course in computer mathematics.

Making special provisions for time for inservice work.

Holding seminars for supervisors and administrators.

How can pilot projects be started?

Some States have developed an extensive and coordinated program of inservice mathematics education activities. In other States, there appear to be scattered efforts by local school systems but little activity at the State level. What are the factors in these situations?

Criteria for pilot projects. If a pilot project on ways of providing inservice education for mathematics teachers is needed, what criteria should be used to determine the type of project worth financial or leadership support? These have been suggested: Does the proposal involve a different or unusual approach to one or more aspects of inservice education? Can the project serve as a model for use by other school systems? Is the strategy of the project clearly and carefully designed? Does the proposal hold reasonable promise for success?

Initiative in planning. Any person or group with interest, enthusiasm, and ambition to undertake a pilot project could take the initiative in planning one.

State or local project. The needs of the particular situation would most likely determine whether the project should be conducted at the State or local level. Counsel on the decision might be sought from staffs of colleges or universities, State departments of education, professional mathematical associations, State educational associations, affiliated groups, or specialists in the U.S. Office of Education.

Potential sources of financial assistance. If the State receives Federal funds under provisions of the National Defense Education Act, the State department of education might be asked whether the proposal was eligible for matching funds. If the proposal calls for a college and a school system to work together to improve school curriculum and teacher training, the college may be able to secure financial support for it from the National Science Foundation. Such a project might qualify for participation in the NSF *Cooperative College and School Program.*

What are some of the unanswered questions and problems?

1. What are the criteria to be used in selecting highly successful instructors of inservice mathematics classes? What procedures will result in effective applications of the criteria?

2. There are various sources of financial support for programs of inservice mathematics education. A single publication listing these sources, the eligibility requirements for participation, and the application procedures to be used should be made available to State supervisors and others.

3. Firm lines of communication need to be established between all groups making decisions on the inservice education of mathematics teachers. How can this best be done?

4. How can the efforts of private and public institutions be more effectively coordinated?

5. Many local school systems need information identifying people who are qualified and willing to assist in inservice mathematics programs. An association or affiliated group could contribute to mathematics education by compiling a list of such persons and making copies available.

6. In what ways can the slower achievers learn mathematics more effectively? the faster achievers?

7. Apparently a sizable number of teachers lack sufficient motivation to improve their competence in teaching mathematics by participating in programs. What measures, if any, should be taken in this situation?

8. Should a larger proportion of NDEA, Title III, funds be given to mathematics? Is the present division of 73.8 percent to science, 17.6 percent to languages, and 8.6 percent to mathematics equitable?

9. How can the contributions of professional organizations to inservice education be expanded?

10. What should be the guidelines for the content of inservice courses in elementary school mathematics?

11. How can the vast number of elementary school teachers acquire the depth of knowledge they need?

12. How can the effectiveness of inservice education programs for mathematics be measured? Do pupils of teachers who have participated in inservice programs show evidence of improvement in knowledge, interest, and attitude related to mathematics? What objective measures of evaluation can be conveniently applied?

CHECKLISTS | *Suggestions for inservice programs in mathematics*

The following checklists are a product of the Office of Education conference on inservice education for teachers of mathematics, March 7–8, 1963. They were prepared in order to *suggest* ideas for inservice programs, not to *judge* individual programs. Some of the questions listed apply more appropriately at State level than at local level; some questions may not apply at all in a particular situation.

The checklists may be useful to various groups of people: Administrators who are making plans to set up inservice programs; mathematics advisory committees working on local or State curriculum and inservice plans; supervisors in the various levels of a particular school system; and State supervisors who are planning and organizing inservice education; college staffs which are planning inservice programs.

CHECKLIST 1. Getting started

1. Have the professional personnel become aware of what is new in mathematics and the implications for inservice education?
2. Is leadership available from a supervisor, principal, or superintendent?
3. Has assistance been sought from the State department of education?
4. Are the administrators stimulating the planning and organizing of the inservice program?
5. Have the persons in leadership positions taken the initiative in taking the first steps in planning inservice programs?
6. Has the responsibility for organizing and developing the inservice program been definitely assigned?
7. Has a study been made of the needs of teachers in connection with the new mathematics?
8. Has identification been made of the potential sources of assistance in planning, developing, or executing the programs?
9. Have provisions been made for teachers to have a part in setting up the program, through surveys, suggestions, expressions of preference?
10. Have a few teachers in the school or school system used and evaluated one or more of the modern experimental programs with their classes?
11. Have the present courses of study been evaluated in terms of the new needs in mathematics?
12. Has the cooperation of colleges and universities been sought in fulfilling needs for inservice work?
13. Have plans been made for informing parents and the public of the curriculum changes that are needed or underway?
14. Have guidelines been formalized in writing to give direction and continuity to the inservice program?

CHECKLIST 2. Expanding

1. Are there communication and cooperation among school administrators, professional organizations, and colleges

which are sponsoring inservice programs?

2. Are teachers encouraged to become members of their professional organizations and grow professionally by attending their meetings, reading their journals and publications, and thus becoming aware of trends and activities in their field?
3. Are inservice or extension classes located so that they will be available to a maximum number of teachers with a minimum amount of travel?
4. Is provision made for inservice opportunities for general elementary school supervisors and principals separately from classroom teachers?
5. Are teams of secondary and elementary school personnel working together as leaders in inservice work?
6. Is quality instruction provided for each inservice class?
7. Is the instructional program of inservice classes appropriate to the level of preparation of the teachers who are enrolled?
8. Is the content of the inservice courses organized so as to insure adequate attention to the unifying concepts of mathematics?
9. Is use being made of many new media for instruction, such as television, kinescopes of television programs, programed textbooks, overhead projectors?
10. Is use made of capable NSF fellows who have desirable personality traits and who are recognized as leaders by their colleagues, in making more inservice programs available?
11. Are the inservice programs fulfilling the needs of teachers of children of all abilities—the slow learner, the retarded, the underachiever, the average, the gifted?
12. Are there noncredit offerings as well as courses for credit?
13. Has a variety of approaches been used, such as study groups, seminars, workshops, institutes, committee work?
14. Are teachers encouraged to study and and to try out experimental programs?
15. Are administrators appointing teacher committees to study and select new textbooks and other materials for use in teaching?
16. Are bibliographies prepared and distributed to promote individual professional study?
17. Are bulletins or newsletters issued to keep teachers and professional leaders informed of current developments? Are some sections or issues written for the elementary school teacher?
18. Is information disseminated on inservice opportunities provided by summer, academic year, and inservice institutes sponsored by the National Science Foundation?
19. Is information about new programs and practices in mathematics being sought out and made available?
20. Are opportunities provided for teachers to discuss mathematics curriculum improvements with other groups such as PTA, civic groups, other school systems?
21. Is released time made available for inservice work for elementary school teachers? For secondary school teachers?
22. Have mathematics laboratories been set up which can be used as instructional centers for inservice education?
23. Are the resources of the community utilized—personnel, financial support, etc.?

CHECKLIST 3. Financing

A. Have provisions been made for financial support by—
   1. State departments of education? _____
   2. The local school district? _____
   3. An intermediate school unit? _____
   4. NDEA? _____
   5. NSF? _____
   6. Other Federal funds? _____
   7. Joint support from several agencies? _____
   8. Business and industry? _____
   9. Other community sources? _____

B. Are there financial provisions for —
   1. Leadership (consultants, instructors, study group leaders, etc.) for inservice programs?
   2. Professional books and materials for study by teachers?
   3. Experimentation with programed or other materials for some kinds of inservice work?
   4. School participation in educational television projects?
   5. Expenses for teachers, principals, and supervisors to attend institutes?
   6. Released time for special assignments or inservice work such as classes which meet at some distance from the school and curriculum work?
   7. Salary increments in recognition of professional growth in approved inservice work?
   8. Salaries for teachers who do curriculum work for their district or State in the summer?
   9. Grants-in-aid, depending on the fulfilling of certain requirements, for teachers to take college courses in the summer?

CHECKLIST 4. Evaluating

1. Is information collected to indicate the numbers of teachers participating in inservice programs? Elementary? Secondary?
2. Are periodic evaluations made to determine the strengths and weaknesses of the inservice program?
3. Does classroom teaching reflect updated content? Updated method?
4. Has the inservice work resulted in updated courses of study in mathematics? Elementary? Junior high? Senior high?
5. Has interest been stimulated in discovering more about how students learn mathematics?
6. Do pupils of teachers who participate in inservice programs give evidence of increased achievement, added interest, or improved attitudes in mathematics?
7. Do the students demonstrate increased proficiency in mathematics at the next school level?
8. Has the inservice program contributed to an evaluation of the mathematics curriculum and instruction in the school?
9. Have college mathematics offerings and content been modified to recognize the advances made at the precollege level?
10. Do teachers' activities and membership in professional mathematics organizations reflect renewed interest gained from inservice education?
11. Is there an increase in the percentage of students taking elective courses in mathematics? Girls? Boys?
12. Is there evidence that the pupils are doing a better job in science since the new programs were begun?
13. Do the parents report that the pupils indicate that mathematics is important?
14. Have provisions been made to secure teachers' evaluation of the inservice program?
15. Is there increased and more effective use of materials of instruction by teachers who have participated in inservice programs?

OFFICE OF EDUCATION FREE PUBLICATIONS IN 1962–63

Request single copies from the Publications Distribution Unit, U.S. Office of Education, Washington 25, D.C. Please include publication number with request.

Adult Education

Adult Education—Dimensions and Necessities (OE–13021).

Civil Defense: Adult Education Program (OE–13010–B).

Cooperative Research

Project English Newsletter, Issue No. May 1962 (OE–30006–1); Issue No. 2, September 1962 (OE–30006–2).

Elementary and Secondary Education

Aids for Teaching Science: References for High School Science Teaching (OE–29038).

The All-Year School (OE–10020).

Central Office Services to Elementary Schools: Organization Responsibilities, and Coordinating Activities (OE–23028).

Directory of Counselor Educators, December 1962 (OE–25036).

Education for Young Children (OE–20002–34).

Education Joins Housing and Welfare in Coordinated Federal Effort (OE–10026).

The Elementary School Mathematics Library: A Selected Bibliography of Recent Titles (OE–29040).

Guide for Implementing Handbook III: Property Accounting for Local and State School Systems (OE–23029).

How Fare American Youth in 1962? (OE–20047).

Lists of Books for Retarded Readers (OE–35042).

Selected Aerospace Career and Scholarship Information (OE–26005–1A).

Selected References of General-Usage Facilities and Equipment for Secondary Schools (OE–21009).

Selected References on Administration of Equipment and Supplies (OE–21011).

Selected References on Migrant Education (OE–20045).

Selected References on Specialized Facilities and Equipment for Secondary Schools (OE–21010).

Teaching Machines and Programed Materials in Mathematics (OE–29035).

Higher Education

Advance Report on Engineering Degrees (1961–62) and Enrollments (Fall 1962) (OE–54004–62).

Bachelor's Degrees in Science and Mathematics Expected for 1961–62 and Junior-Year Enrollments in Science, Mathematics, and Foreign Languages (OE–54021–62).

Directory of College Courses, in Radio and Television: School Year 1961–1962 (OE–34014).

Campus Parking Bibliography (OE–51004–10).

College Union Planning Aids (OE–51004–13).

Colleges, Universities, and Public Vocational Schools with Aviation Flight and/or Grouped School Courses Approved by the Federal Aviation Agency (OE–25012–62A).

Expenditures Planned for Higher Education Facilities, 1961–65 (OE–51004–6).

Faculty and Other Professional Staff in Institutions of Higher Education, 1959–60: Summary Report (OE–53014).

Fifth-Year Programs of Classroom Teacher Education: A Digest of the Survey Report (OE–58007).

Gross Area of Non-Residential Buildings, by Facilities Category (OE–51004–14).

A Half-Century of Salaries at Land-Grant Institutions, (OE–52004–3).

New Construction and Rehabilitation on College Campuses, 1959–60 (OE–51004–15).

Regular-Year Scholarship Programs of Institutions of Higher Education Applicable for Summer Session Study, 1960 (OE–55033).

Salaries and Fees in Land-Grant Colleges and State Universities, 1962–63 (OE–52004–5).

A Statistical Analysis of Graduate Degrees Awarded by Land-Grant Institutions in 1958–59 (OE–50031).

Student Accommodations in Instructional Facilities, 1960–61 and Planned for 1965–66 (OE–51004–4).

Student Charges and Faculty Salaries in Junior Colleges, 1961–62 (OE–52004–2).

Student Infirmary Planning Aids (OE–51004–11).

Summary Report of Financial Statistics of Institutions of Higher Education, 1959–60 (OE–52007).

Summary Report of Bachelor's and Higher Degree Conferred During the Year 1960–61 (OE–54010–61).

Summary Report on Survey of Students Enrolled for Advanced Degrees: Fall 1961 (OE–54009–61).

Travel Programs Sponsored by Institutions of Higher Education in Summer Sessions (OE–54028).

International Education

Educational Materials Laboratory Report:

- A Classification Scheme for Elementary and Secondary School Textbooks in Educational Materials Centers (OE–14031–21).
- Recent Additions to the Collection: Reference Tools (OE–14031–16).
- Seasons and Holidays (OE–14031–20).
- The United Nations (OE–14031–19).
- Western Europe (OE–14031–23).

El Progreso de la Instruccion Publica en Los Estados Unidos de America, 1962–63 (OE–10005–63–D).

Information on Education Around the World:

- No. 56. The Kingdom of Greece (OE–14034–56).
- No. 62. Uruguay (OE–14034–62).
- No. 64. Ecuador (OE–14034–64).
- No. 68. The Research Section in the Japanese Ministry of Education (OE–14034–68).
- No. 69. Republic of Ireland (OE–14034–69).

Les Progres de l'Instruction Publique aux Etats-Unis d'Amerique, 1962–63 (OE–10005–63–B).

The Liberal Arts in a Revolutionary World (OE–56013).

The Peoples' Friendship University in the U.S.S.R. (OE–14073).

Progress of Public Education in the United States of America, 1961–62 (OE–10005–62–B).

The Recommendations of the 25th International Conference of Public Education (OE–14034–66).

Teacher Exchange Opportunities: Summer Seminars—Teaching for American Elementary, Secondary, and Junior College Teachers (OE–14047–64).

Library Services

EDUCATION OF THE LIBRARIAN FOR THE MODERN SCHOOL (OE–15041).

LIBRARY RESEARCH IN PROGRESS, No. 7 (OE–15005–7).

LIBRARY RESEARCH IN PROGRESS, No. 8 (OE–15005–8).

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THE EDUCATIONAL MEDIA PROGRAM: SELECTED EDUCATIONAL MEDIA PROGRAM PUBLICATIONS (OE–34023).

NATIONAL DEFENSE COUNSELING AND GUIDANCE TRAINING INSTITUTES: SUMMER 1963, ACADEMIC YEAR 1963–64 (OE–25015–64).

NATIONAL DEFENSE GRADUATE FELLOWSHIPS: GRADUATE PROGRAMS, 1963–64 (OE–55017–64).

NATIONAL DEFENSE LANGUAGE INSTITUTES: SUMMER 1963, ACADEMIC YEAR 1963–64 (OE–27011–64).

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PROJECTS INITIATED UNDER TITLE VII, PART B, NATIONAL DEFENSE EDUCATION ACT: JULY 1, 1958–AUGUST 31, 1962 (OE–34021).

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